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To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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DECLINE IN COMMERCE.

In his annual report, the State Engineer of New York says that the port of New York which, a third of a century ago, commanded 73 per cent. of the total exports of the nation, to-day commands but 37 per cent. of them. Statistics presented, show that New York foreign commerce has never been so low as last year since 1850.

It is in her exports that New York's commercial losses have occurred. In imports she almost holds her own, at two-thirds of the nation's total. In exports she has fallen from two-thirds to a little more than one-third of the whole. From 1880 to 1897 the nation's foreign commerce increased $300,000,000 in value. During that time New York's has increased $20,000,000; Boston's, $63,000,000; Galveston's, $29,000,000, and New Orleans', $17,000,000. These and similar timely statistics in the engineer's report show that the problem of retaining New York's commercial prestige is a grave and pressing one, the chief factors in which he believes to be adequate and efficient waterways constantly facing the lowest possible transportation charges, and ample docks, equipped with everything that will expedite and minimize the cost of handling commerce.

Furthermore, he believes that the present inadequate condition of the canals is largely responsible for the decline of commerce at New York City, and that the improvements now being made should not only be promptly completed but that steps must be taken immediately for better facilities and lower terminal charges for canal traffic, especially at Buffalo and New York. He believes that the great danger to New York state is that without these improved conditions, an enormous volume of traffic is now and will continue to be diverted to points outside of this state, so that canals railroads, and the people generally will loose the profits that should accrue from the traffic.

Mr. Adams described the progress that has been made in the work of improving the canals, and presents a number of tables showing the total estimated cost of the work to be $16,000,000.

A WRECK MARKED.

A central pile will be driven close to where the wreck of the City of Duluth is located at St. Joseph, Mich., and six supporting piles will be driven and clamped about it. From the central pile the entire spar of the steamer without the topmast, 83 feet long, which has been recovered, will be erected from the top, to which the warning light will be exposed. With favorable weather the work should be accomplished by the end of this week, as it was begun on Snnday last. The wreck lies due west of the north pier.

WANTS LAKE SHIPYARDS TO COMPETE.

Assistant Secretary of the Navy Theodore Roosevelt is a strong champion of the proposition to permit the building of war vessels in the shipyards of the Great Lakes. He has declared himself in strong terms in the presence of F. W. Wheeler, of the Wheeler Ship Building Co., of West Bay City, and Congressman Wm. Alden Smith.

"Whatever influence I have in this department," said Mr. Roosevelt, "shall be exerted to put an end to the present state of affairs in which the government loses the advantage of the competition of the lake shipbuilders."

Mr. Roosevelt stated that he was not in favor of placing any more war vessels on the lakes, and believed the agreement between the two countries, limiting the force to one ship each, was an excellent one, but in his opinion it never should have been construed to prevent lake shipyards from building small vessels like torpedo boats, which need not be armed until after their transit through the canals.

STURGEON BAY CANAL ENTRANCE LIGHT.

The necessary money for the establishment of a new coast light at the entrance to the Sturgeon Bay ship canal, Lake Michigan, has been appropriated and at last reports the Light-House Board informed Congressman Minor that the circular tower and lenses of bended glass, the contract for which has been placed in France, has been completed and likewise the steel work for the tower, which was to have been done at Detroit. The light is to be the best that science can produce. It will be a flash light, and the tower will be circular glass, showing no flat surfaces. The tower will be 80 feet high and built entirely of steel. The flash system to be operated in connection with the light will be visible from all points of the compass. In all probability work on the structure will commence in the early spring. The light will be the first of the kind on the lakes.

ELECTRIC PROPELLING SYSTEM.

The stockholders of the Erie Canal Traction Co., which is said to have the exclusive right to equip the canals of the state of New York with electricity, held their annual meeting in New York city last week. About $4,000,000 of the stock of the company was represented at the meeting. The following were elected directors: Louis A. Von Hoffman, William G. Oakman, Richard S. Hayes, G. G. Haven, Thomas C. Platt, Frank W. Hawley, Alfred S. Heidelbach, Commodore P. Vedder and Charlton T. Lewis. These directors elected the following officers: President, Louis A. Von Hoffman; vice-president, Frank W. Hawley; secretary and treasurer, Charlton T. Lewis; general manager, Commodore P. Vedder. No action was taken on the proposition to issue $5,000,000 bonds to equip the Erie canal with the electric propelling system. The delay by the state in completing the enlargement of the canal, it was said, made any action on bond issues impracticable.

PROGRESS OF WORK ON THE PANAMA CANAL.

Under date of Nov. 3, 1897, Consul-General Gudger, of Panama, issued a report on the progress of the Panama canal construction, which may seem somewhat surprising in view of the general impression that very little has been done since the old company went into liquidation several years ago. A new company was organized and work begun in 1894, since which time about 3,000 laborers, on the average, have been employed. The new organization is composed mostly of Frenchmen, as was the old one. Some time during the next 12 months a committee will investigate the progress of the work, and if a favorable report is made it is expected that means can be procured for pushing the work more rapidly. The visit by this committee is looked forward to as a turning point, as then it will be decided whether the work will cease or be prosecuted with greater vigor. If after that time the work is continued at all it is expected that the force will be so increased that the canal can be finished in from 7 to 10 years.

The canal is now practically finished from Colon, on the Atlantic, to Bujeo, a distance of 14 miles. The total length of the route from Colon to Panama, on the Pacific, is 54 miles. The work already completed is on the least difficult and least expensive part of the route. The width of the canal will be 160 feet on top and 72 feet on the bottom, except through the Culebra cut, where it will be 78 feet on top and 29 feet on the bottom. This cut presents the most difficult problem of the whole undertaking, and it was in consideration of the difficulties encountered at this point that the plan of building the canal without locks had to be abandoned.

Work was first begun on the canal in 1882, and continued until 1889, when there was an interruption until 1894. Most of the time from 1882 to 1889, 10,000 laborers were employed. It is estimated that fully $100,000,000 has been expended for machinery up to the present time, a large part of which is now scattered along the river and stored under sheds rusting away in the damp climate. The cost for labor, materials, salaries, etc., has been estimated at $275,000,000. The canal is about one-third completed and it is thought that with what machinery and materials still remain, $150,000,000 will be required to complete the entire work.

WOODEN SHIPS.

Appropos of the recent stranding at the North Sea of a wooden schooner built as far back as 1793, the Nautical Magazine for December remarks that the Truelove, of 285 tons, built in the United States in 1764, lasted for 124 years. A brig, the Amphitheater, built in 1776, was turned into a coal hulk about 112 years later. Then there is the Robert, built in 1775, and still heading up for port after over 115 years hard work. The convict ship Success, which was recently exhibited as a curiosity in the Manchester docks, was built of teak, in 1790, at Moulmein, and came to England from Australia when over a hundred years old. Of warships, the old Victory dates from 1765, built at Chatham; and the United States Constitution has completed her century in state this year, having been built at Boston, Mass., in 1797. The Herefordshire and the Earl of Balcarres, teak ships built in India, were more than 100 years old on retirement.

STEAMBOAT LINE TO GEORGIAN BAY.

Officials of the Canada & Atlantic Transportation company, which will this season establish a line of sail between Duluth and Parry Sound on Georgian Bay in connection with the Canada & Atlantic road, will make arrangements for dock room, offices, etc., at Duluth. It is understood that there are several persons considered for the position of agent of the new company at the head of the lakes.

NEWS AROUND THE LAKES.

CHICAGO.

Special Correspondence to The Marine Record.

The Dunham Towing Co. towed the steamer Kalkaska to the Minnesota elevator to load, on Tuesday.

Burger & Burger, shipbuilders, Manitowoc, are building a new tug 65 feet long for Thomas Bradwell, of Chicago.

A. L. Fitch chartered the steamers H. W. Sibley for wheat and Charles A. Eddy for corn and wheat loading at Manitowoc.

Miller Bros. have started doing repair work on the Western Transit and Anchor line steamers in winter quarters here.

The Independent Tug Line's floating dry dock had the steamer Lorain L. in for some repairs and calking, the tug J. G. Van Schaick for some general repairs.

The Goodrich Transportation Co.'s steamer City of Ludington, which is to be re-named the Georgia, will leave Burger & Burger's dry dock in about two weeks.

The new tug being built for the Goodrich Transportation Co. by Burger & Burger, Manitowoc, will be of the following dimensions: 90 feet keel, 100 feet over all, 20 feet beam, 12 feet molded depth.

At a meeting of the Chicago Transit Co. held January 29, Capt. J. S. Dunham was elected president and general manager; O. S. Richardson, vice president; A. Lenke, treasurer; Jas. A. Channon, Secretary.

The teamer I. W. Nicholas has been chartered to load at South Chicago for corn at 2½ cents. There is very little doing here in chartering boats. Carriers are adhering firmly to 2½ cents on corn to Buffalo.

At the annual meeting of the Dunham Towing & Wrecking Co. held Saturday, Capt. J. S. Dunham was elected president and treasurer; Capt. James R. Lincoln, general manager; R. J. Dunham, secretary.

The Independent Tug Line towed the steamer Lansing and schooner George Sturges to Armour's C elevator, the steamer Escanaba to the Atlantic elevator, the H. A. Tuttle to the Santa Fe elevator to load grain.

Capt. James H. Green, of Buffalo, is at this port inspecting the hulls of the fleet in winter quarters which require inspection in behalf of the Inland Lloyds. Charles Van Every and Capt. Charles Anderson are his assistants.

Capt. John Kemming, of the schooner Capt. G. H. Naghtin, intends next week getting ready to paint and fit out his schooner. Capt. Kemming is usually one of the first to begin and last to lay up at the end of the season, and is one of the most successful schooner masters on the lakes.

Robert E. Hills has organized a company called the Hills-McCanna Co. for the purpose of manufacturing patents owned by himself and John and Ben McCanna. The business of engineers' supplies and his general work is continued by himself the same as before, having organized for the purpose of putting his patented articles into an independent company.

The Marine Engineers' Beneficial Association, No. 4, of Chicago, held their twenty-third annual reception and ball at the Medinah Temple Wednesday evening, February 2. D. H. Robertson and wife were leaders of the grand march, in which some 150 couples took part. The attendance was large, the music excellent and the dancing some of the very best, a most enjoyable evening was spent by those present.

The Montague Iron Works, of Montague, Mich., have closed a contract with the Craig Ship Building Co., Toledo, to build two fore and aft compound engines 12 and 14 by 16 each for a large tug building by the Craig company for service on Alaskan waters. They are also building a fore and aft compound engine 14 and 30 by 20 and a marine boiler 8 by 12 for a tug by E. W. Heath, at Benton Harbor, for Lydon & Drews, contractors, Chicago.

The Dunham Towing & Wrecking Co. are building a new marine boiler 12 ft. long by 7 ft. 9 in. diameter to be allowed 150 lbs. steam pressure, for their tug James McGordon. They will also rebuild her from the water line up. They have overhauled and put new tubes into the boilers of the tugs Hackley, Perfection and Protection, and are making extensive repairs on the latter tug. They put new decks on the schooner A. Mosher, a patch on the boiler of the steamer Simon Langel and overhauled her machinery, some new deck and hatch coamings on the steamer North West, supplied the whaleback steamer A. D. Thomson with a new rudder, gave the steamer Aurora a general overhauling, the steamer Yale some general repairs, and the steamer City of London a new deck house.

The wooden steamer W. H. Gratwick loaded with 92,000 bushels of barley sank last Thursday night at her winter dock in the light-house slip. The southwest gale on Thursday lowered the water in the river, causing the steamer to settle on the bottom and she listed over until the discharge pipe became submerged and the water poured into the hold. The Dunham Towing & Wrecking Co. went to the steamer Friday morning and pumped her out. The O. S. Richardson Fueling Co.'s floating derrick lightered the dry barley, consisting of about 24,000 bushels, into four canal boats, and the steamer was towed Tuesday morning to one of the Illinois Central slips by two of Dunham's tugs. C. W. Elphicke & Co., who chartered her, will dispose of the wet barley to the highest bidder.

BUFFALO.

Special Correspondence to The Marine Record.

John M. Conroy has been appointed chief engineer of the E. C. Pope, of the Shaw-Eddy line, Henry Annett, of Detroit, former engineer of the Pope, having been tra sferred to the City of Bangor, of the same line.

Capt. James Delaney, St. Catherines, who for several seasons has been piloting between the Welland canal and Montreal, has recently had a severe trial in the loss of his wife who died of consumption on the 7th of December after an illness of more than a year.

A name has been selected for the new tug built for southern waters and now nearing completion at Hingston & Son's yard. She will be called the William Magee. The Magee will be ready to forward to her owners as soon as the ice will permit her to start from here.

There is quite an amount of work being done on vessels and the yards of the Union Dry Dock Co. are quite a busy place. Hingston & Son are also employing all the men that can work to advantage on their building contracts. The steamers Avon and W. H. Stevens are being thoroughly overhauled and repaired.

I learn through Capt. Delaney, of St. Catherines, that Capt. A. McMaugh is building a new tug for Welland canal work. Capt. A. Chestnut will sail the steamer Melbourne this summer, and Capt. R. Chestnut the steamer Cuba. Other appointments already made are Capt. J. Moore, Myles; Capt. Mackie the Tilley, and Capt. W. Zealand the steamer Lake Michigan.

At the United States Engineer's office in this city has been prepared, under direction of Maj. Thomas W. Symons, Corps of Engineers U. S. A., a moded of the first thousand feet of the new breakwater. The model is made from careful measurements of the work completed when cold weather put a stop to operations last fall. The model is of wood and plaster, on a scale of ten feet to the inch, and shows exactly the shape of the pile of stone which forms the completed part. The model is something over eight feet long. At the ends and center are wooden sections, showing the shape of the breakwater when completed.

Again there is talk of taxing the grain stored in elevators at this port. It frequently happens that hundreds of thousands of bushels of grain representing almost as many dollars are stored in the Buffalo elevators for months at a time, and in the opinion of some of the assessors is properly a subject of taxation just as much as stocks, bonds or other personal property. To establish the ownership of the grain and to get at the owners so as to make an assessment which will stand might be difficult and the solution suggested is that the elevators be taxed as agents for the wners. Then the agents to collect the tax from the owners as best they can.

It is now understood that the Lake Carriers' Association will cause a bill to be presented at Albany regulating the elevator charges here, and will have for its argument that a reduction of charges will make Buffalo the receiving port of all the grain trade, whereas now some of it is being diverted by rail to the seaboard. This bill will fix the steam shovel at 25 cents per 1,000 bushels and the elevating charge at ⅛ of a cent a bushel, thus saving the members of the Lake Carriers' Association a large sum of money each season, and yet allow the elevators a profit, but not such a profit as the pool now receives. The question of freight rate being covered to correspond with the decrease in charges seems not to be given much attention by vesselowners just now, and perhaps it does not mean so much to the smaller or medium-sized vessels, but it will count greatly in favor of the large class of boats and tend to make grain freights lower than ever.

DETROIT.

Special Correspondence to The Marine Record.

The Naval Reserve drill ship Yantic was dry docked on Wednesday for repairs. The work will require about two weeks.

It is hoped that a large attendance will be found at the meeting of the lumber carriers to be held at Hotel Normandie here, next Tuesday. This is a worthy and excellent departure and should be joined in by all lumber carrying interests so that fair living freights for carrying lumber may be the rule this season.

The annual election of the Thompson Navigation Co. was held on Tuesday, and the following officers were elected: President, E. L. Thompson; treasurer and manager, F. M. Thompson; vice president, C. A. Chamberlain; secretary, R. H. Phillips. The first three named gentlemen form the board of directors. The Ionia Transportation Co. will also have the following officers this year: F. M. Thompson, president and treasurer; E. L. Thompson, vice president; and W. W. Kelly, secretary.

Capt. Alex. Begg, recently of the steamer Minnie E. Kelton, and for a number of years in charge of C. J. Smith's boats, the steamer Doty and schooner Olive Jennette, has been given command of the steel steamer Simon J. Murphy. The Murphy is owned by L. H. McCormick, of Menominee, and was built by F. W. Wheeler & Co., about three years ago. She has all the modern improvements, including complete electric lighting system, and the latest labor saving devices for handling both ship and cargo.

Wheeler & Co's. shipyard, which reopened on Monday, was closed again the next day. Of the 200 men who sought employment only two entered the yard on Tuesday and they soon came out. A score of other men who went to apply for work were persuaded by the riveters to remain idle. Anticipating some disturbance the sheriff sent five deputies to the yard, but their services were not required. The directors of the company will hold a meeting this week to determine the course of action to pursue.

It now seems almost certain that this will be the biggest season in history in the matter of lumber shipments from the head of the lakes. Lumber, however, does not influence other lake freights. The lumber carriers will undoubtedly have a much more profitable season this year than last, but there is so much small tonnage constantly forced in the lumber trade since the building of the larger class of carriers that there is no telling whether the increased lumber shipments will be of very much advantage after all.

Nearly three hundred men are at work on the City of Erie, the Cleveland & Buffalo Transit Co.'s new steamer, at the Detroit Dry Dock Co.'s Wyandotte shipyards, and in the course of the next two weeks the new steamer will be launched. The contract price for building the City of Erie is $375,000. She will be the 126th ship built by the Detroit Dry Dock Co. Her dimensions are as follows: Length at the water line 314 feet, length over all 324 feet, breadth over all 78 feet. It will thus be seen that she is sixteen feet longer and two feet wider than the City of Buffalo. In other respects the two steamers are almost alike.

OWEN SOUND, ONT.

Special Correspondence to the Marine Record.

The government will place 95,000,000 whitefish spawn in Lakes Ontario, Erie, Huron and St. Clair next summer. The eggs are now being hatched in the Sandwich fish hatchery.

The North Shore Navigation Co. has given out the following appointments for the season of 1898: Steamers—City of Collingwood, W. J. Bassett, master; W. J. McQuade, first officer; M. Ironside, second officer; C. Robertson, engineer. City of Midland, F. X. Lafrance, master; W. W. Cox, first officer; W. Whipps, chief engineer; P. L. Patterson, purser. City of Parry Sound, S. Walton, master; J. L. Smith, chief engineer; H. A. Currie, purser. City of Toronto, A. C. Cameron, master; D. McQuade, chief engineer and purser.

PORT HURON.

Special Correspondence to the Marine Record.

Foot passengers are walking across the river at foot of Button street.

The steamer Ed. Jenks has been sold to E. J. Solon, the coal dealer, of Toledo, Ohio.

Capt. Chris Smith leaves for Chicago this week to look after the re-building of a tow barge.

The fleet of boats laid up in Sarnia Bay are receiving the necessary overhauling ready for spring.

The frames are about half up for the Jenks' new tug; they are rushing the work with a full gang of men.

St. Clair offers a trip across the river on ice now, but it is not supposed that this will last long as the weather is too mild to keep ice fit for walking on.

Capt. Buzzard, who has been a great sufferer from rheumatism, for several years past, is much improved, and expects to be able to resume sailing in the spring.

Captain and Mrs. Samuel Palmer, who have been spending several weeks in this city with Capt. and Mrs. I. T. Palmer, have returned to East Tawas, where Mr. Palmer is stationed as light-house keeper.

The marine engineers have moved their lodge from over E.C. Boice's dry goods store to a fine suite of rooms over the banking house of J. J. Boyce & Son, No. 509 Water street. The rooms will be furnished in fine style and everything as it ought to be.

George Bowen, a marine engineer at this port, says the wind blew so hard one day last week that it blew a girl through her belt and left the belt on the sidewalk and he also says you never hear of any such winds from the Weather Bureau, the coast or oceans, and George is a philosopher, too.

W. D. Ragan, owner of the barge Jupiter, denies that the boat, which is at anchor in Sarnia Bay, swung around during the storm of Sunday last, causing the schooners Cataract and Breck to drag their anchors. He says the Jupiter has not moved an inch since laying up last fall.

Over a year ago a cinder struck Capt. Wm. Curtis in the eye. A small sore formed in the corner and it was deemed advisable to cut it out. In doing so the nerves were destroyed, since which time he has been unable to raise the eyelid. Unless the nerves can be restored the accident will result in blindness for that eye.

The board of water works commissioners, at Bay City, opened bids this week for a new horizontal tubular boiler to replace one of those now in use in the battery of five at the pumping station. Four proposals were received and that of John A. Flajole, for $621.50, being the lowest, was accepted. It is expected that the new boiler will be in place in about 60 days.

Assistant Secretary of the Treasury Spaulding has reduced the fine of $400, imposed by the collector at Marquette upon the master of the steamer Roanoke, for violation of the rules relating to the navigation of the "Soo" to $20. The offense of proceeding at a greater rate than seven miles per hour was proven, but as this was the first charge ever filed against the master, the action above stated was taken.

TOLEDO.

Special Correspondence to the Marine Record.

Capt. George Skeldon, harbormaster, is slightly under the weather, but a few days will no doubt see him around again as active as ever.

There has been considerable ice cutting going on in the river here recently, but as it now shows signs of honeycombing work has been stopped.

Contracts have just been let at Sandusky by various local yachtsmen for several new yachts, some fine and costly, to be used in regattas the coming season. Some of the craft are now in course of construction. There are two strong rival clubs, and yachting next summer promises to furnish the best sport that Sandusky has ever enjoyed.

Capt. Homer Durand is a very popular man here, well known and appreciated by a large circle of friends. It has been suggested that the next honor after being elected president of the Shipmasters' Association is to secure his nomination as a candidate for mayor of the city. Capt. Durand is positive, aggressive and possessed of a well balanced mind, so that the civic honor would be not only becoming but very fitting.

The coming season is expected to be an active one in the passenger steamboat business. There will be two certain and possibly three boats of the D. & C. line between Toledo, Put-in-Bay, Lakeside and Cleveland. The steamer Metropolis may again run to the Bay and Lakeside. The steamer City of Toledo and Darius Cole will be on the Toledo and Detroit route. No arrangements have as yet been made as to what boats will run to Monroe Piers, but it is certain that this route will be well served. The steamer Pastime will again run to Presque Isle. The big D. & C. boats will, as last year, be on the route between Toledo and Mackinac, and the State of Michigan, it is said, will be on the route between Toledo and Detroit.

Small schooner property don't amount to much now. Capt. Straight, owner of the schooner Mineral State, says that if his schooner was at Chicago, he would charter three or four steamers and advertise a real burning of a vessel at sea, or on the lake. He would tow his schooner out on the lake, saturate her with coal oil, and when the steamers arrived with their passengers, he would set the vessel on fire. This would give the people an idea of the destruction by fire that has overtaken many vessels far away from land. He says the time for th burning of the boat would be on a calm night, which would bring out the most vivid points, and also it is to be thought the most dollars, as this departure would not be made for the pleasure of the thing alone.

SHEBOYGAN, WIS.

Special Correspondence to the Marine Record.

The largest steamer here with coal last season was the steamer Coralia, she being 432 feet over all.

The fishing here at present is reported as being very good. Tugs make daily trips, and are very seldom kept in on account of bad weather. The fishing grounds is within a radius of forty miles from this port.

One peculiarity about the Manitowoc winter fleet, is that she has the distinction of holding all winter the only steamer on the lakes that has four spars, with fidded topmasts, the steamer's name being Hiram W. Sibley. She is owned by Benj. Boutell of W. Bay City.

The friends of Capt. George Bell at Sheboygan, were quite elated at hearing of his promotion from the Gilchrist line, to the Zenith Transportation Co. ,of Duluth, and wish him every success. Capt. Bell is well known in Sheboygan, having been here time and again, in the City of Naples, with cargoes for the C. Reiss Coal Co.

The steamer Manchester is in dry dock at Milwaukee. The Manchester struck near the Limekilns or at Ballard's Reef, in Detroit river, late last fall, and suffered bottom damage that caused a slight leak. The injury was not sufficient, however, to prevent her from finishing the season, after temporary repairs had been made.

A great many of the Sheboygan people are beginning to lose faith in the old "Ground Hog," or bear theory, which is so eagerly watched on "Candlemas-day," as we have been enjoying regular spring weather ever since. Last Wednesday, (Candlemas-day) the sun shone bright all day here, and in consequence, the old "Ground Hog" seeing his shadow, goes back into his "hole" for another six weeks, which of course means six weeks more of solid winter.

Last week several officers of the advancement association here, went to Milwaukee to have an interview with Senator Barney, who was there for a brief visit only, in regards to appropriations for the harbor improvements here. Although nothing definite was done, they had a very favorable talk with Senator Barney in regard to the same. Although the officers, (or representatives) went to Milwaukee, they thought it would have been a great deal more advisable if Senator Barney had come tc Sheboygan and inspected the port himself.

CLEVELAND.

Special Correspondence to The Marine Record.

Repairs on the steel steamer Globe have been completed at the yards of the Ship Owners' dry dock.

The Aurania will be in the Cleveland dry dock for a day or two yet having some bottom damage repaired, the Castalia will follow her.

The officers of the Globe Iron Works Co. seem to be quite easy relative to the recent strike of the riveters at the shipyard and it is stated that while 450 men are now employed, applicants for work are being turned away daily.

Capt. C. E. Benham is slated for the position of collector of customs, and, as the appointment rests chiefly in the hands of Senator M. A. Hanna there is no doubt expressed but that the energetic and otherwise well qualified aspirant for the office will be duly appointed.

The Iron Clad Paint has kept up its end for over a quarter of a century and is still held in high repute by the most reliable shipowning firms. It is a plesaure and profit to use the genuine article, and Mr. Wade, 22 Case building, is always at liberty to meet his patrons courteously and supply their orders to the best of his ability.

Superior City has been decided upon as the name of the steel steamer now on the stocks at the yard of the Cleveland Ship Building Co., in Lorain, for the Zenith Transportation Co., of which Capt. A. B. Wolvin, of Duluth, is the manager. The Superior City is 430 feet keel and an over all length of 450 feet, 50 feet beam and 28 feet molded depth.

At a meeting of the Civil Engineers' Club the following officers, who will be elected at the March meeting, were nominated: President, Frank C. Osborne; vice-president, S. T. Wellman; treasurer, Walter Miller; secretary, William H. Searles; librarian, William E. Reed; directors, Joseph R. Oldham, S. T. Dodd, R. A. Harmon and C. W. Hopkinson.

On February 15 there will be a civil service examination held in the government building for employes of the steamboat inspection service. A notice to this effect has recently been posted in the building. The examination will not only be for new applicants for positions, but it will apply to some of the officers who are at present in the service. Among such in Cleveland are inspector of hulls, George L. DeWolf; inspector of boilers, James McGrath and assistant inspector of boilers, William F. Plietz.

There has seldom been so mild a winter as the present one. Now, only in the early portion of February the weather is warming up and we seem to be getting as much sunshine as is usual about the middle of April, the days are perceptibly lengthening and all indications are of a spring like nature although it is too early to even think about fitting out, or the opening of navigation. Many of those who went south to cheat the winter would have got along nearly as well by remaining here.

A new keeper has just taken charge of the local life-saving station. Considering that he was not detailed by the chief of the service, his supreme contempt for all rules of discipline, and his tyrannical overbearing conduct may be partly borne with until the station goes into active service again, when it is expected that his methods of madness may be temporarily restrained before the crew become utterly demoralized by the arbitrary disposition already evinced by this masculine ten-pounder. Capt. Motley is entitled to see-gars for the latest life-saving hero-ity exhibited by his competent coxswain.

FLOTSAM, JETSAM AND LAGAN.

The life saving station at Evanston, Ill., is to be moved 100 feet nearer the shore.

Capt. Alex. Begg of Bay City, will command the steel steamer S. J. Murphy the coming season.

Louis Sebastian, of Toledo, has been appointed chief engineer of the large steel steamer Kearsarge.

The wooden steamer William H. Gratwick laden with 92,000 bushels of barley, was lying at Chicago when the water in the river fell so much that she rested on the bottom. She listed to starboard so far that her discharge pipe was submerged and the water ran into her and wet 50,000 bushels of the grain. The loss will fall on the underwriters.

The Senate committee on naval affairs has agreed to recommend an amendment to the naval appropriation bill authorizing the secretary of the navy to enter into a contract with existing armor plants for supplying armor for the three battleships, the Alabama, Illinois and Wisconsin, now in course of construction, at s rate not above $400 per ton for armor, including the nickel in it.

Capt. Alex. McDougall, manager of the American Steel Barge Co. returned to Duluth last week. He went to the Pacific coast to ascertain what the opportunities were for operating the company's shipyard at Everett, in the constructing of vessels for the Alaska trade. He says that the prospect was not encouraging for the reason that the boats under construction for the Yukon river trade do not require the facilities that are provided by a modern shipbuilding plant.

This great country, washed by two oceans, ought to have thousands of vessels flying the American flag and it would have if the true American sentiment prevailed. No country has more exports and imports. If American shippers would insist upon American vessels, the ship building industry in this country would take a quick and healthy advance. To deplore the decline of the American ship will not cover the ocean with the American flag. But liberal support to the American vessel will.—Philadelphia Item.

The London correspondent of the Liverpool Journal of Commerce writes as follows: Negotiations have been for some time pending between the Canadian government and the Allen line with reference to the charter of one of the company's steamers, and I am now authorized to make the following announcement: It appears that Lieut. Devore, of the United States War Office, has definitely arranged with Messrs. Allen to dispatch their steamer Manitoban to Norway at once to embark the 500 reindeer urgently wanted for the Klondike relief expedition. The deer will be accompanied by their late owners, who are Laplanders, and who will take with them their wives and families, in number about 150. Without their masters the deer would be quite useless, for they will obey no one else, and indeed the animals are treated almost as members of the Laplanders' families.

A novel advertising scheme is reported this week from Conneaut. The project will be known as the Conneaut Advertising and Distributing Co. A boat to be brigantine rigged is now under construction, it is stated, under the supervision of the manager of the company, which, when completed, will be the medium of transportation. With this boat the company will next summer sail from St. Louis to the Gulf of Mexico, landing at all the cities on the coast and following a systematic mode of advertising for the firms which may contract with them for such work. They propose to do a general advertising business, distributing circulars and samples through the cities they visit. The boat is to be 70 feet over all with a 13½-foot beam, but with a flat bottom necessary for navigation in shallow water. The average draft will be about two feet, but arranged with water ballast tanks that she can draw over five feet. There will be accommodations for a crew of 22 men, with two state rooms for private use, all equipped with modern improvements in the sanitary line.

ANNUAL ELECTION OF OFFICERS OF MICHIGAN OWNED TRANSPORTATION LINES.

Detroit & Cleveland Navigation Co.—James McMillan, president; Hugh McMillan, vice-president; W. C. McMillan, treasurer; David Carter, secretary and general manager. These and George Hendrie are directors.

State Transportation Co.—John Pridgeon, Jr., president; Joseph King, vice-president; B. W. Parker, treasurer; A. A. Parker, secretary and general manager.

Peninsular Transit Co.—A. A. Parker, president and general manager; W. H. Oades, vice-president; Harry S. Hodge, treasurer, B. W. Parker, secretary. The officers with A. R. Munger, are directors.

Parker Transportation Co.—A. A. Parker, president and general manager; A. R. Munger; vice-president; B. W. Parker, secretary; H. W. Dyar, treasurer. The officers, with F. B. Gaylord, are directors.

Pridgeon Transit Co.—John Pridgeon, Jr., president; John S. Quinn, vice-president; B. W. Parker, treasurer; A. A. Parker, secretary and manager. These, with A. R. Munger, are directors.

Northwestern Transportation Co.—H. H. Brown, president; L. C. Waldo, secretary, treasurer and general manager. These, with Geo. E. Hartnell, S. E. Hartnell and D. A. McLachlan, are directors.

Ionia Transportation Co. will elect these officers later.—F. M. Thompson, president and treasurer; E. L. Thompson, vice-president; W. W. Kelly, secretary.

Vulcan Transportation Co.—E. T. Peck, president; J. B. Baugh, vice-president; S. A. Baugh, second vice-president; James Findlater, secretary and treasurer.

Progress Transportation Co.—C. A. Black, president; Charles White, vice-president; Alex. McVittie, secretary and treasurer.

Roby Transportation Co.—George W. Roby, president; L. C. Waldo, secretary and treasurer.

Ogdensburg Transit Co., Utica, Mich.—E. C. Smith, St. Albans, Vt., president; A. McVittie, Detroit, vice-president; F. W. Baldwin, Ogdensburg, secretary and treasurer.

Thompson Navigation Co. will elect these officers later—E. L. Thompson, president; C. A. Chamberlin, vice-president; F.M. Thompson, treasurer; R. H. Phillips, secretary.

Wolverine Steamship Co.—John B. Roby, president; W. M. Freer, vice-president; A. McVittie, secretary, treasurer and manager. These, with James McMillan and F. J. Hecker, are directors.

Dry Dock Navigation Co.—President, A. McVittie; vice-president, Frank E. Kirb ; secretary and treasurer, G. N. McMillan.

Inter-Lake Transportation Co.—P. J. Ralph, president; C. D. Waterman, vice-president, and H. C. Ralph, secretary and treasurer.

Michigan & Ohio Car Ferry Co.—E. H. Moreton, president and general manager; C. S. Turner, secretary and treasurer; the other directors being W. C. Maybury, Frank E. Kirby and J. W. Warwick.

Stewart Transportation Co.—George Peck, president; C. F. Bielman, secretary and treasurer; Capt. A. E. Stewart, vice-president and general manager. The other directors are George N. Fletcher and John Barlum.

J. Emory Owen Transportation Co.—J. F. Owen, president; W. J. Gray, vice-president and treasurer, and J. C. Johnson, secretary.

There is no change in the directors of the Duluth & Atlantic Transportation Co., nor in those of the Detroit Transportation Co. Both have elected directors and postponed the election of officers until later. There will be no changes, however. Of both companies James McMillan is president, Hugh McMillan is vice-president, and W. C. McMillan secretary and treasurer. Capt. J. W. Millen is general manager and George M. Black, auditor.

The Crescent, Buffalo and Duluth, Swain Wrecking Co., Star-Cole, Red Star, White Star, Michigan and Percheron Navigation Cos., postponed their election until later in the month.

DETERMINATION OF THE MAGNETIC CO-EFFICIENTS BY THE METHOD OF LEAST SQUARES.

(COMMUNICATED.)

The magnetic co-efficients are generally derived from observations of the deviations. According to the English Admiralty Manual "to derive the greatest advantage from the observations, two problems have to be solved: 1st. From observations made on a small number of points to find the most probable value of the deviations on the intermediate points. 2d. From observations made on a large number of points to find the most probable value of the deviations on each point." Further: Correct mathematical methods "require a considerable amount of calculation," therefore, "the graphic solution due to I. R. Napier, Esq., F. R. S." is resorted to "requiring no calculation and only a moderate degree of neat-handedness."

This graphic method of correcting the deviations by means of Napier's diagram, however, has the following defects:

First, it ignores entirely the fundamental law of quadrantal and semi-circular deviations being numerically alike in both semi-circles; secondly, it entirely ignores the exact as well as the approximate co-efficients, leaving the correction of the observed deviations at the mercy of "a moderate degree of neat-handedness" to draw a "flowing curve," with no reliable means whatever to determine which way to make the correction, so as to reduce the errors instead of increasing them. In the third place, it ignores that the curve representing the deviations, is not always a "flowing curve" with ordinates steadily increasing or decreasing, but has sometimes several turning points at short intervals, due to the peculiar shape of the *dygogram*. A practical illustration of this kind furnishes the deviation tables in Evan's Manual of H. M. S. Warrior when upright and heeled.

From all of which it appears that the method of "neat-handedness" for finding the most probable value of the deviations can not be depended upon.

It is a matter of fact that any graphic method to be reliable and exact, must be based upon correct algebraic formulae, and must be a representation of these formulae. And it is no less a fact that errors in the observed deviations can only be found by ascertaining the most probable values of the co-efficients or constants first, and from them derive the most probable value of the deviations on each point.

The exact values are distinguished from the most probable values, thus: The methods for obtaining exact values of the co-efficients ignore the errors in the observations; the method of least squares by which the most probable values of the co-efficients and, consequently, also of the deviations are obtained, compensates the errors in the observations to a nicety; and the most probable values of the co-efficients are such for which the sum of the squares of the remaining errors in the observations is a minimum.

The separation of the quadrantal and semi-circular deviation, by means of simple addition and subtraction of the observed deviation's total on opposite courses, furnishes the means for treating each part of the deviation separately and in a measure independently of the other. The quadrantal deviation is fully independent of the semi-circular deviation, no matter how small or large the latter may be. Its co-efficients, therefore, may be separately determined. The semi-circular deviation partly depends on the quadrantal deviation which, however, is a constant quantity. With a full knowledge of the latter, therefore, we may determine the two other constants of the semi-circular deviation also by a separate process.

The co-efficients of the quadrantal deviations are A, D and E. The most probable value of A always equals the arithmetical mean of the quadrantal deviation on eight or sixteen equidistant compass points (in pairs considered four and eight) expressed in parts of radius one. This knowledge enables us to treat A as a constant quantity in applying the method of least squares to D and E, by which the computations are greatly simplified. As for the semi-circular deviation also only two quantities, B and C, have to be determined, computations are reduced to two sets, each containing two quantities, which, in applying the method of least squares, is an immense gain.

To get an idea of the great amount of labor saved, it must be remembered that by applying the method of least squares the labor increases as the square of the number of unknown quantities. Determining the five unknown quantities, A, B, C, D and E in a bunch by this method, requires an amount of work represented by the square of 5 equal 25. For two quantities the square is only 4; and for twice two quantities, two times 4 equals 8. The labor in both cases is therefore represented by the figures 25 and 8 respectively. In other words, the labor is reduced to one-third the former labor. Under such favorable circumstances the method of least squares has a better show of being more frequently applied in practice.

We shall now proceed to illustrate the workings of the method in general and in particular:

The method of least squares requires that some approximate value of the constants be known, which may be obtained graphically or by computation. With these approximate constants the deviation is computed for all courses on which observations have been taken, and the computed values are subtracted from the observed values by which the approximate errors are obtained. Next, the differential co-efficients, showing the variation of the deviatiou when one of the constants varies, are computed and tabulated.

The formula for the quadrantal deviation reads: Tangent quadrantal deviation equals A plus the product of the quadrantal force G and the sine of twice the compass course plus starboard angle of G; the whole divided by one minus the product of G and the cosine of twice the compass course plus starboard angle of G.

The differential co-efficient x of the quadrantal deviation in regard to the starboard angle of G equals the product of G and the cosine of twice the compass course plus starboard angle of G, plus quadrantal deviation. The product divided by the cosine of the quadrantal deviation plus product of A and the sine of the quadrantal deviation, minus the product of G and the cosine of twice the compass course plus starboard angle of G, plus quadrantal deviation.

The differential co-efficient y of the quadrantal deviation in regard to the force G equals the co-efficient X multiplied by the tangent of twice the compass course plus starboard angle of G plus quadrantal deviation, the product divided by G.

As basis for illustrating the process of figuring may serve the deviation table of compass No. 49 of the double turreted monitor Miantonomoh of the U. S. Navy.

TABLE NO. 1.—OBSERVED DEVIATION TOTAL.

Compass Courses.	Deviation.	Compass Courses.	Deviation.
N	− 5° 13′	N	− 5° 13′
NNW	−17 16	NNE	6 39
NW	−22 54	NE	15 14
WNW	−24 5	ENE	19 47
W	−21 52	E	21 37
WSW	−16 41	ESE	20 52
SW	−10 25	SE	17 12
SSW	− 1 16	SSE	11 34
S	5 47	S	5 47

By taking half the sum and half the difference of the deviations on opposite courses, commencing with N over E we obtain respectively the quadrantal and semi-circular deviation by observation for the eastern semi-circle, as in table 2.

TABLE NO. 2.—OBSERVED QUADRANTAL AND SEMI-CIRCULAR DEVIATION.

Compass Course.	Quadran al Deviation.	Semi-circular Deviation.
N	0° 17′	− 5° 30′
NNE	2 42	3 58
NE	2 25	12 50
ENE	1 33	18 14
E	−0 8	21 45
ESE	−1 37	22 29
SE	−2 51	20 3
SSE	−2 51	14 25

With these preliminaries the reckoning proper may be commenced.

The algebraic sum of the quadrantal deviation equals −0° 30′; consequently the most probable value of A equals −0° 30′ divided by 8 equal −3.75′ = −0.001125. From the quadrantal deviations on N and E is found an approximate value of E = 0.0037; and from the quadrantal deviatio s on NE and SE an approximate value of D = 0,0460. From D and E we obtain the value of G = 0.0462 and its starboard angle $b = 4° 36'$.

With these approximate values of G and b the following table 3 is computed:

TABLE NO. 3.—APPROXIMATE VALUES (QUADRANTAL.)

Compass Course.	Computed Dev.	Observed Dev.	Errors: In degrees and min.	Errors: In parts of rad.	Square of Errors.
N	0° 9′	0° 17′	0° 8′	0.0023	64
NNE	2 1	2 42	0 41	0.0119	1681
NE	2 34	2 25	−0 9	−0.0026	81
ENE	1 36	1 33	−0 3	−0.0009	9
E	−0 16	−0 8	0 8	0.0023	64
ESE	−2 1	−1 37	0 24	0.0070	576
SE	−2 43	−2 51	−0 8	−0.0023	64
SSE	−1 50	−2 51	−1 1	−0.0177	3721
					6260

The next thing is to compute the differential co-efficients x and y, and make their squares and the following products, x y x e and y e e representing the errors in table 3. Thus we obtain:

TABLE NO. 4.—DIFFERENTIAL CO-EFFICIENTS, ETC.

Compass Course.	x	y	x Square.	y Square.	x y	x e	y e
N	0.048	0.087	2,304	7,569	4176	96	174
NNE	0.030	0.808	900	652,864	24240	360	9684
NE	−0.006	0.987	36	974,169	− 5922	18	− 2961
ENE	−0.035	0.601	1,225	361,201	−21035	35	− 601
E	−0.044	−0.072	1,936	5,184	3168	− 88	− 144
ESE	−0.030	−0.716	900	512,656	21480	−210	− 5012
SE	0.002	−1.002	4	1,004,004	− 2004	− 4	2004
SSE	0.035	−0.696	1,225	484,416	−24360	−630	12528
Sum			8,530	4,002,063	− 257	−423	15672

To preserve uniformity the e's in table 3 have been taken with three decimals in the multiplication; thus the figures in all columns of the preceding table, excepting x and y, are decimals of 6 places. By the sums at the foot of each column the correction of b and G is found as follows:

1. The correction of the starboard angle b equals the product of the sums in ye and x y columns minus the product of the sums in x e and y square columns; the rest to be divided by the square of the sum in x y column minus the product of the sum in x square and y square column.

2. The correction of the force G equals the product of the sums in x e and x y columns minus the product of the sums in ye and x square column; the rest to be divided by the same divisor as before under 1.

In figures we have therefore:

$$\text{Correction of } b = \frac{-15{,}672 \times 0.257 \text{ plus } 0.423 \times 4002.063}{0.257 \text{ square} - 8{,}53 \times 4002{,}063}$$

$$= \frac{1688.79}{-34137} = -0.0489$$

$$= -2° 50'$$

$$\text{assumed } b \quad 4\ 36$$

$$\text{most probable value of } b = 1° 46'$$

Note.—All the figures entering the reckoning have been multiplied by 1,000 which does not effect the result.

$$\text{Correction of G} = -\frac{0.423 \times 0.257 - 15{,}672 \times 8.53}{-3437}$$

$$= \frac{133.57}{34137} = 0.0039$$

$$\text{assumed G} = 0.0462$$

$$\text{most probable value of G} = 0.0501$$

With these corrected values of G and b and the most probable value of A the following table is computed:

TABLE NO. 5.—MOST PROBABLE VALUES OF THE QUADRANTAL DEVIATION AND OF THE ERRORS.

Compass Course.	Most Probable value of Dev.	Observed Quadrantal Deviation.	Most Probable Errors of Observation.	Square of Errors.
N	0° 2′	0° 17′	0° 15′	225
NNE	2 6	2 42	0 36	1296
NE	2 48	2 25	−0 23	529
ENE	1 50	1 33	−0 17	289
E	−0 9	−0 8	0 1	1
ESE	−2 5	−1 37	0 28	784
SE	−2 56	−2 51	0 05	25
SSE	−2 7	−2 51	−0 44	1936
Sum				5085

A comparison of the sum of the squares of errors in the preceeding table with those in table No. 3 shows the beauty of the result.

If the quadrantal deviations were four times larger the effect would probably be more conspicuous than now.

It now remains only to ascertain the most probable values of the semi-circular deviation and its constants, which is in nearly all respects similar to ascertaining them for the quadrantal deviation.

The formula for the semi-circular deviation reads: The sine of the semi-circular deviation equals the product of the force F and the sine of the compass course plus starboard angle of F divided by c.

c is obtained from the quadrantal deviation and equals the denominator in the formula given for the quadrantal deviation divided by the cosine of the quadrantal deviation.

B and C commonly used are only substitutes for F and a. The differential co-efficients x of the semi-circle deviation in regard to the starboard angle a equals the product of the force F and the cosine of the compass course plus starboard angle divided by the product of c and the cosine of the semi-circular deviation.

The differential co-efficient y of the semi-circular deviation in regard to the force F equals the sine of the compass course plus starboard angle divided by the same product as before.

When the semi-circular deviation on any course exceeds 10 degrees all the differential co-efficients have to be multiplied before being tabulated by a quantity from the following table, the semi-circular deviation on the course to which the dfferential co-efficient belongs being the argument.

TABLE NO. 6.—FOR CORRECTING DIFFERENTIAL CO-EFFICIENTS.

Semi-circular Deviation.	Multiplier.	Semi-circular Deviation.	Multiplier.
0°	1.000	30°	1.047
5	1.001	35	1.065
10	1.005	40	1.086
15	1.012	45	1.110
20	1.021	50	1.140
25	1.033	55	1.256

From the semi-circular deviation on N and E approximate values are found for the force F and its starboard angle a.

$a = -13° 10'$ F = 0.3997

With these values and the respective c's of the quadrantal deviation the following table is computed:

TABLE NO. 7.—APPROXIMATE VALUES (SEMI-CIRCULAR).

Compass Course.	Computed Dev.	Observed Dev.	Errors: In degrees and min.	Errors: In parts of rad.	Square of Errors.	Multiplier.
N.....	- 5° 30′	- 5° 30′	0° 0′	0.0000	0	1.003
NNE...	3 51	3 58	0 7	0.0020	49	1.002
NE....	12 8	12 50	0 42	0.0122	1764	1.008
ENE...	18 15	18 14	-0 1	-0.0003	1	1.018
E	21 45	21 45	0 0	0.0000	0	1.026
ESE...	22 24	22 29	0 5	0.0015	25	1.027
SE.....	19 51	20 3	0 12	0.0035	144	1.021
SSE ...	13 59	14 25	0 26	0.0076	676	1.011
Sum....	.....	.....	.....	.....	2659	.....

The square of errors is only given for later comparison. As before, we have now to compute the differential co-efficients etc., as contained in the following table:

TABLE NO. 8.—DIFFERENTIAL CO-EFFICIENTS, ETC.

Compass Course.	x	y	x Square.	y Square.	xy	xe	ye
N.....	0.413	-0.242	170509	58564	- 99946	.....	.....
NNE..	0.410	0.169	168100	28561	69290	820	338
NE.....	0.349	0.542	121801	293764	189158	4258	6612
ENE	0.241	0.840	58081	705600	202440	72	- 252
E.....	0.096	1.024	9216	1048576	98304	.....	....
ESE	-0.070	1.059	4900	1121481	- 74130	- 105	1589
SE.....	-0.229	0.901	52441	811801	-206329	- 802	3154
SSE.....	-0.351	0.630	123201	396900	-221130	-2668	4788
Sum.....	.....	.....	708309	4465247	- 42343	-1575	16229

To find the correction of the starboard angle a and of the force F from the sums at the foot of the preceding table, the same rules obtain as for the quadrantal deviation by only substituting a for b and F for G.

Therefore,

$$\text{Correction of A} = \frac{-16.299 \times 42.343 \text{ plus } 1.575 \times 4465.25}{(42.343)\text{ square} - 708.3 \times 4465.25}$$

$$= \frac{6345.51}{-3160979.31} = -0.0020$$

$$= - \ 0° \ 7'$$

assumed $a = -$ 13 10

most probable value of $a = -$ 13° 17′

$$\text{Correction of F} = \frac{1.575 \times 42.343 - 16.229 \times 708.3}{-3160979}$$

$$= \frac{11428.8}{3160979} = 0.0036$$

assumed F = 0.3997

most probable value of F = 0.4033

With the corrected values of F and a the following table is computed:

TABLE NO. 9.—MOST PROBABLE VALUES OF THE SEMI-CIRCULAR DEVIATION AND THE ERRORS.

Compass Course.	Most Probable value of Dev.	Observed Semi-circular Deviation.	Most Probable errors of Observation.	Square of errors.
N.....	- 5° 36′	- 5° 30′	0° 6′	36
NNE.	3 50	3 58	0 8	64
NE..	12 12	12 50	0 38	1444
ENE. ...	18 23	18 14	-0 9	81
E.	21 57	21 45	-0 12	144
ESE.....	22 37	22 29	-0 8	64
SE... ...	20 4	20 3	-0 1	1
SSE.....	14 9	14 25	0 16	256
Sum...	....	.....	....	2090

To finish the work we have only to make up a full deviation table from the data in tables No. 5 and No. 9.

TABLE NO. 10.—MOST PROBABLE VALUES OF THE DEVIATION TOTAL AND OF THE ERRORS OF OBSERVATIONS.

Compass Course.	Quadrantal Dev.	Simi-circular Dev.	Deviation total.	Observed Dev.	Errors of Observation.
N.....	0° 2′	- 5° 36′	- 5° 34′	- 5° 13′	0° 21′
NNE....	2 6	3 50	5 56	6 39	0 43
NE.....	2 48	12 12	15 0	15 14	0 14
ENE....	1 50	18 23	20 13	19 47	-0 26
E.....	-0 9	21 57	21 48	21 37	-0 11
ESE. ...	-2 5	22 37	20 32	20 52	0 20
SE.....	-2 56	20 4	17 8	17 12	0 4
SSE.....	-2 7	14 9	12 2	11 34	-0 28
S..	0 2	5 36	5 38	5 47	0 9
SSW	2 6	- 3 50	- 1 44	- 1 16	0 28
SW.. ...	2 48	-12 12	- 9 24	-10 25	-1 1
WSW ...	1 50	-18 23	-16 33	-16 41	-0 8
W.....	-0 9	-21 57	-22 6	-21 52	0 14
WNW...	-2 5	-22 37	-24 42	-24 5	0 37
NW.	-2 56	-20 4	-23 0	-22 54	0 6
NNW ...	-2 7	-14 9	-16 16	-17 16	-1 0

Chicago, Feb. 7, 1898. JOHN MAURICE.

A BUFFALO-TOLEDO LINE.

The Toledo, St. Louis & Kansas City railroad (Clover Leaf Route), which has operated a lake freight line between Toledo and Buffalo for several years, will, in all probability, add two passenger boats to its fleet this season and establish a direct passenger route between those ports.

The officials of the road are negotiating with the owners of the steamers Badger State and Empire State, and if the deal is carried out, those boats will be used to open the route and encourage trade. If the line proves successful, two propellers of modern type will be built for the service.

The route is now covered indirectly by the Cleveland & Buffalo Transit Co., by its Cleveland and Buffalo, and Cleveland and Toledo divisions, with transfers at Cleveland.

ICE CRUSHER AT THE STRAITS OF MACKINAC.

The car ferry Ste. Marie plying across the Straits of Mackinac has found the ice decidedly troublesome this winter; more so, perhaps, than at any previous period in her history. One morning early in January she left the upper peninsula for Mackinaw City with a number of loaded railroad cars and when about half way over encountered heavy fields of drift ice, through which she was unable to work her way. She was held in the ice most of the day, and was carried several miles out of her course. Finally, the steamer St. Ignace, another ice crusher, was sent to the rescue and succeeded in releasing her.

Later gales piled the ice to a great height along the south shore of the Straits and one of the wharves at Mackinac City has been demolished. At one time, when the Ste. Marie was working her way through the windrows, a man could have easily stepped from her hurricane deck 25 feet above the water to the top of a hummock.

The ice crushers Ste. Marie and St. Ignace are the results of some very remarkable experiments in winter navigation. When the Michigan Central was pushed north to Mackinaw City, and the Detroit & Marquette railway was completed from the Straits to Marquette, the transportation of freight and passengers across the five miles of water separating the upper and lower Michigan peninsulas, was a serious problem.

LACK OF A COMMERCIAL MARINE.

In recent government statistics we read that 91 per cent. of our exports are carried in foreign vessels, owned by foreigners and flying foreign flags. It is not a wise state of affairs that we should pay such enormous tolls on the great free highways of the world. One becomes appalled in contemplating the vast tonnage passing through the Suez canal on its way to India, China and Japan. Again we are astonished at the immense fleet of merchant marine of England, Germany and Sweden, as it steams up the Baltic on its way to Russia. In all this the American flag plays no part.

Adam Smith, in his "Wealth of Nations," written over 100 years ago, which has since become the text book of the political economists of Europe, speaking of exporting and of ships, says: "No community can become permanently prosperous without a shipping trade." As the decree has gone forth in the United States that we are not to have free ships, then we should have subsidized ones. They are cheap at any cost. It would create at once remarkable activity on our eastern and western seaboards, and new shipyards would spring up. This would cause an enormous demand for material that would be furnished by all parts of the country. There should be no sectionalism in this. One part of the country cannot be full of business without all parts being benefited. We have been occupied in the past developing our land; let us now develop the ocean. Let the good old days come back when a boy's highest ambition was to go to sea.

What our boys and young men want is opportunity. Let us create that opportunity.. Let our surplus young men who are doing women's work in the stores come out from behind the ribbon and bargain counters and grapple with the real issue of life. Let us build up the grand race of American seamen; we had it in former days. Let the smoke of our steamers blacken every horizon. Let United States vessels flying the Stars and Stripes be seen in all the great ports of the world. These, gentlemen, constitute some of the great problems before us. We believe the genius and enterprise of the American people will be equal to their solution.—The Tradesman, Chattanooga, Tenn.

THE Flint and Pere Marquette steamers cannot handle freight as fast as it is being received at Manitowoc for shipment eastward. An accumulation of 1,500 loaded cars is reported.

CORRESPONDENCE.

☞ We do not hold ourselves responsible in any way for the views or opinions expressed by our correspondents. It is our desire that all sides of any question affecting the interests or welfare of the lake marine should be fairly represented in THE MARINE RECORD.

DEPTH OF WATER BOTTOMS.

COLLINGWOOD, ONT., Feb. 8, 1898.

To the Editor of the Marine Record:

Will you kindly answer the following in next week's RECORD? What steamer on the lakes has the deepest water bottom? Has the Centurion 72 inches of a water bottom? By answering the above you will greatly oblige.

A SUBSCRIBER.

The deepest water bottom on the lakes is found in the new steel steamer building for the Bessemer Steamship Co. by F. W. Wheeler & Co., West Bay City, Mich., which is 72 inches. The tow barge building for the same owners has a water bottom of 5½ feet, all others range from 30 to 60 inches, the Centurion having only a 54 inch water bottom.

[ED.

A DRIFTING SIGNAL WANTED.

CLEVELAND, Feb. 9, 1898.

To the Editor of the Marine Record:

In the steering and sailing rules of 1894 I find in the last half of Rule IV: "Steamers when drifting or at anchor in the fair way of other vessels in a fog or thick weather shall ring their bells at intervals of not more than two minutes," thus classifying vessels drifting with those at anchor.

In the law under which we now serve, commonly known as the White law, we find in Rule I, last sentence: "A vessel is under way within the meaning of these rules, when she is not at anchor or made fast to a dock or aground." While this makes a provision not found in previous rules, that in regard to boats aground, it entirely ignores the other condition or that of boats drifting, and it is this condition that I would like to hear an opinion in regard to.

Suppose a steamer to be going up the lake at night and something was to happen to her boiler so that she would have no steam and her engines would become useless; what would she do supposing her to be in a position where her anchors would be useless? Of course if she had sail she would take in her white mast-head light and just leave her side-lights out, as she would be considered a sailing vessel. But suppose, as is generally the case with our lake steamers, she has no sail, what then will she do? Will she then take in everything but her side-lights, or will she, seeing she has no control over herself and is at the mercy of the wind and current, put up her anchor lights?

According to the present law she is not considered as a steamer because she is not under steam; and the only thing left for her is to consider herself a sailing vessel, which in reality she is not as she has no sails to control herself with.

Even in clear weather there would be a chance for trouble, as a vessel seeing one or the other of her sidelights would infer she was a sailing vessel under way which, as I have said, she in reality is not.

Suppose it was thick weather, what then would she do? She is not at anchor according to law and so could not use her fog bell as prescribed for vessels at anchor, as the law expressly says she is not at anchor but under way.

Suppose she was to blow her fog horn, the only thing left to her, what blasts would she blow?

There are but three conditions allowed for in the law for sailing vessels in thick weather. She blows one blast when on the starboard tack, two blasts when on the port tack and three blasts when running free.

She could make use of none of these signals, as she would be in none of thepositions these signals would signify her to be in.

Now, what I would like to know is this: What lights would a vessel carry when drifting, and what fog signals shall she use in thick weather according to law? T. W.G.

VISIBLE SUPPLY OF GRAIN

As compiled for The Marine Record, by George F. Stone, Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY. Bushels.
Buffalo	1,160,000	2,670,000	139,000	50,000	617,000
Chicago.....	9,728,000	15,539,000	1,289,000	560,000	666,000
Detroit	117,000	20,000	6,000	23,000	11,000
Duluth and Superior	2,335,000	2,050,000	1,750,000	1,148,000	588,000
Milwaukee.....	129,000	123,000	97,000	35,000	70,000
Montreal.....	94,000	61,000	677,000	48,000	40,000
Oswego.....	.....	.....	.....	.....	.....
Toledo.....	240 000	480,000	370,000	37,000	.....
Toronto	51.000	.....	14,000	.....	27,000
On Canal	.....	.....	46,000	.....	.....
On Mississippi	175,000	43,000	.....	.....	.....
Grand Total.....	36,022,000	39,505.000	14,766,000	3,596,000	2,673,000
Corresponding Date, 1897.....	47,885,000	23,332,000	13,324,000	3,864,000	3,321,000
Decrease	580,000	1,076,000	346,000	244,000	355,000

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific slope.

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CLEVELAND, O., FEBRUARY 10, 1898.

OF what use are time balls, as adopted by the hydrographic office on the lakes anyway? There are no chronometers to regulate, and as a rule the state legislatures or the railroad companies regulate the time as desired, so that sidereal, apparent or mean time does not count.

A MOST careful consideration is asked from our readers to the communication contained in this issue on the "Determination of the Magnetic Co-efficients by the Methods of Least Squares," from the pen of John Maurice, of Chicago. The RECORD would like to know that each shipmaster on the lakes is as conversant with the magnetic properties of the compass needle as he is with the errors of his timepiece.

THERE is no reason why lake shipyards should not compete with the coast yards on building naval tonnage. Surely the shell can be formed on the lakes and the vessel floated to any point for equipment. A vessel is nothing but a steel tank until she is ready for service, and, as well may the Anglo-American treaty forbid us to build, say boilers, for instance, as to prevent lake shipbuilders from bidding on the construction of steel hulls. Assistant Secretary of the Navy Theodore Roosevelt is supremely correct in his contention on this point.

CHICAGO brokers seem confident that they can procure cargoes for all the boats that are wintering at Lake Michigan ports, so that owners will not be obliged to begin the season by jumping headlong in the ore trade with the inevitable result of sending the rate down to a profitless basis as was the case last year. There seems to be a widespread impression, owing to the lack of precipitation in any form this winter, that there will be a lower stage of water in the connecting waters of the lakes the coming season, and it is expected that this fact will be something of a factor in keeping rates up, at least it ought to have such an effect.

SHIPBUILDING on the Pacific coast promises soon to become an even more important interest than on the Atlantic coast. As we have frequently pointed out, all Asia and the south seas lie at the door of the Pacific. The commerce there, including the Alaskan trade, will in the future be greater than the Atlantic traffic. Timber and other material for building merchant vessels are to be had cheap on the Pacific coast. A great firm of eastern naval constructors have become so well aware of these considerations that it is rumored that they are already securing themselves by preparing to establish an extensive shipbuilding plant on Puget Sound. The American Steel Barge Co., with Mr. Rockefeller's millions at its back is already well established there. It is the bounden duty of the United States to foster and encourage commerce and shipping industries on the Pacific slope. The major portion of transportation interests should be carefully and jealously guarded for Americans.

THE hundreds of individual vessel owners engaged in the Lake Michigan lumber trade should present themselves at the Hotel Normandie, Detroit, on Tuesday next, and formulate a lake freight tariff. The time was, when the lumber trade at Chicago formed an important part of the commerce of that port, but of late years the smaller class of sailing vessels, engaged solely in carrying lumber, have sometimes been compelled to lay up in the middle of the season on account of low freight rates prevailing through undue competition, and, while this threw a number of men out of employment there was nothing else for the master or owner to do only to stop all expenditures when he found that he was losing money in prosecuting his business. Scores of men in Chicago as well as the minor ports on Lake Michigan are owners of, and sail their own vessels. With hard work, also by practicing the closest economy they are sometimes enabled to make a living during the season of navigation, and save a little for winter supplies and a spring outfit. Hitherto there has been no unanimity among these men relative to keeping freight rates up to an even, steady, fair notch, but there has been grumbling enough at the poor, mean, starvation rates offered from time to time, to make them get together if only for self preservation, which after all is the first law of nature. We opine that the larger companies will be ready to accede to any request looking towards a fair and just rate of compensation for lumber carrying, also that in the majority of cases they will be found heartily in accord with the principles governing a regular tariff scale of freights. It now behoves the more distinctly individual owners to join hands by expending a little for traveling expenses to Detroit, and when there, to regulate their trade as also their probable earnings for the coming season.

A CORRESPONDENT calls attention this week to the lack of any signals to be given by vessels when from any cause they are not under control. It may be said that any irregular signal signifying danger or alarm would be understood by passing vessels so that they would proceed with caution in meeting or passing an apparently helpless craft in thick weather; on the other hand, pilots are so law-bound now, or feel so, that a provision covering the situation pointed out ought to be embodied in the new code of sailing and steering rules. This contention is pertinent and we find special provision made for the exceptional case in the international code.

SOME of the daily newspaper scribblers seem to be somewhat dense in quoting figures on lake-built tonnage, and so much so as to make a burlesque of this important industry. Now we will average up at this time for their special benefit and say about $60 per ton register, or $40 per ton burthen for the cost of new steamers, while consorts, schooners so called, or actually tow barges, may be placed at $39 per ton register and $26 burthen.

INSPECTOR 11TH LIGHT-HOUSE DISTRICT.

Lieutenant-Commander Duncan Kennedy, U. S. N., the new light-house inspector for the 11th district, previous to being detailed to the station at Detroit was for three years executive officer on the United States cruiser New York. Lieut. Kennedy was born in Albany and entered the naval academy in 1864, graduating in 1868. Since that time he has seen service in nearly every quarter of the globe. After graduation he was assigned to the Asiatic squadron for three years. He was promoted to lieutenant in 1872. He has served on the Pacific squadron, in the naval academy, has been in charge of important works at New York and other coast towns. He was made lieutenant-commander May 15, 1893, and was then transferred to the New York, where he served until he was ordered to Detroit.

As inspector of the eleventh light-house district Lieut. Kennedy is in charge of the government property and acts as inspector of the naval brigade of state naval reserves. Lieut Kennedy is a distinguished looking man, genial and courteous in manner, a favorite wherever he has been stationed.

THIS SEASON'S INSURANCE

The general agents of insurance companies at Buffalo, Chicago, Milwaukee and Detroit, who were practically forced out of lake insurance last spring, are joining forces for next season's business, and it is expected they will bring about, before the opening of navigation, a pool of their several companies that will enable them to again make a strong bid for business. One movement in this direction is the order to go ahead with a revision of the Inland Lloyd's Register, the work being entrusted to Capt. A. B. Drake, who is experienced in inspection matters, and who will take up headquarters in Buffalo. Vessel owners will accordingly be prompted to delay placing their insurance until the several combinations have entered into active competition for business.

The competition of the Chicago combination, did not result in a loss of business to Johnson & Higgins last year. They lost one fleet that was secured by the Chicago people, but they obtained a big increase in business through the old general agents. The parties that suffered were the Buffalo, Chicago and Milwaukee general agents, who are now trying to bring about a pool for 1898, and bring some of the old business back into line.

OWNERS OF LUMBER CARRIERS TO ORGANIZE.

A meeting of owners of lumber carrying vessels will be held at the Hotel Normandie, Detroit, next Tuesday. The following letter has been sent out to vesselmen by A. M. Carpenter, secretary and general manager of the Jenks Ship-Building Co., of Port Huron:

The replies to my letter of January 22 to the vessel owners is more than gratifying to me. I have received over fifty replies, and each and every one of them seem to be only too anxious to have something done for the benefit of the lumber tonnage. I feel very positive that now is the time for owners to get together, and I would impress the necessity of each and every owner to form himself into a committee of one and make a special effort to attend a meeting and get every other owner to do likewise. The success of the undertaking, I believe, depends largely on being able to have a good, large meeting, when the majority could adopt such plans and regulations as they thought best.

A number of our local owners join me in soliciting your attendance at a meeting to be held at the Hotel Normandie, at Detroit, on February 15.

While most of the vessels engaged in the lumber trade are owned orm anaged at ports in Michigan, yet Chicago, Cleveland, Buffalo and other ports will be represented at the Detroit meeting. Mr. Carpenter and other owners feel satisfied that a minimum rate of freight can be fixed for the coming season.

TO IMPROVE THE CHICAGO RIVER.

Before anything further is done for their improvement Chicago's river and harbor will undergo Congressional inspection. An invitation will be sent to the House Committee on Rivers and Harbors at once to take a personal look at the situation. It will be sent by the River Improvement association, and should be on the way now.

At its annual meeting a few days ago, that body decided to invite the committee, and fixed the time for its arrival for Washington's birthday.

General Thomas J. Henderson was delegated to go to Washington and further the association's scheme for deepening and widening the river and thus insure as far as possible, the additional $400,000 appropriation.

Mr. Merryweather, as treasurer, reported that from Feb. 23, 1896, to Feb. 3, 1898, the receipts have been $8,042 and the expenditures $5,343.

Capt. J. S. Dunham, George Merryweather, Murry Nelson, Jesse Spaulding, George J. Brine, George E. Adams, J. P. Tracy, John C. Spry, Francis Beidler, and W. C. Brown were re-elected directors. They re-elected the old officers: President J. S. Dunham; Vice President, George J. Brine; Secretary, Homer J. Carr; Treasurer, George Merryweather.

A committee on engineering, consisting of W. C. Brown, O. B. Green, J. H. Brown, and George J. Brine, was elected to prepare data in opposition to the claim that dredging the river to twenty feet would dangerously affect the foundations of buildings in the district.

THE ANCHOR LINE ROUTE.

It having been intimated that the steamers India, China and Japan might be secured by John Gordon and a syndicate for passenger trade between Buffalo, Milwaukee and Chicago, E. T. Evans, western manager of the Anchor Line, writes as follows:

"My attention has been directed to the article stating that we contemplated withdrawing the steamers India, China and Japan from the Lake Superior trade. There is no foundation for the report whatever, the subject not even having been under consideration by our company. We expect to continue these boats on the Lake Superior route, and make them, if possible, more attractive to tourist travel than heretofore."

NEW DOCKS AND WAREHOUSES.

A force of men is engaged at the Mineral Range dock at Hancock in order that work may be started on the new dock work there as soon as possible. The o'd dock will be thoroughly rebuilt and strengthened and the new one will face it, extending a distance of over 1,000 feet, making it by far the largest and finest wharf on Portage lake. This, with adequate equipment, will make the delay to vessels doing business at this dock a thing of the past. Already piles and timber for its construction are being secured, and the cost of the structure when completed, which will be about May 15, will be nearly $20,000. Every effort will be made to have the work pushed to completion, as the coal receipts in early spring promise to be exceptionally heavy, for the mines will, with but few exceptions, be well out of fuel, owing to the strike of last summer.

Plans for the large merchandise warehouse of the Eastern Minnesota Railway Co., at Superior, Wis., to be built on its property fronting on St. Louis bay, are now perfected and bids are advertised for the construction of the building. With regard to size the projected structure will be the largest warehouse at the head of Lake Superior, and will have twice the capacity of all the buildings heretofore used by the company. The two flour sheds, one standing on either side of the track, will be taken down entirely, the work being almost finished now, and on the site thus vacated the new warehouse is to be built. The new structure will be 1,500 feet long and nearly 200 feet wide, and have two stories, thus giving it a floor capacity of over 150,000 square feet. In order that the dimensions decided upon may be laid out, it was necessary to extend the lines for one side of the new building into the bay for quite a distance, and it is estimated that some 75,000 piles will have to be driven for the foundation.

THE ERIE CANAL.

On Wednesday, October 20, 1825, at 10 a. m., a boat from Lake Erie started on its voyage via the Erie canal and the Hudson river to New York. The completion of this important link of water transportation, connecting the Hudson river and the Great Lakes was announced to the citizens of the state by the roar of cannon placed in a continuous line along the banks of the canal and the river, at intervals of about 8 miles, and extending from Buffalo to New York City. On Friday, November 4, 1825, the grandest celebration that up to that time ever occurred in the city of New York commemorated the completion of the longest canal in the world and the successful inauguration of an enterprise which has given the name of its illustrious promoter, Governor Clinton, a prominent place in the history of the Empire state. For that early day it was a gigantic enterprise to be undertaken by a state which 70 years before was a wilderness. That it was completed in eight years, at the expense of less than $8,000,000, is a grand testimonial to the honesty, economy, perseverence and business ability of the men who at that time had charge of public affairs.

For 40 years the Erie canal and the lateral canals were the main arteries of travel and traffic, and an important factor in the development of the various business industries of the state. They served their purpose, were worth all that they cost, and indirectly contributed more toward the building up of prosperous towns and cities, and the conversion of the forest into productive farms, than their most ardent advocates ever anticipated. The time required to construct this great work may seem slow to some in this fast age, it suffers nothing by comparison.

THE BARRY TUGS AT DULUTH.

Capt. Miles Barry, manager of the Independent Tug line at Chicago, writes to the Evening Wisconsin, Milwaukee, as follows: "We notice in your issue of February 3, an article from the Duluth News-Tribune intimating that the Barry line may be bought, and wish you would kindly enter our positive denial to the statement. The Barrys have gone to Duluth with the same spirit that characterized their Chicago venture, and we leave it with our friends and business associates to determine the result of our staying abilities. In connection herewith we desire to say that we have associated with us in the Duluth line such well-known and thoroughly marine men as James Davidson, Waldo A. Avery and H. A. Hawgood, names that are the emblem of success."

GRAIN ELEVATOR CHARGES AT BUFFALO.

A break in the elevator pool at Buffalo is threatened by the controversy now going on between the elevator association and the contractor whom the Lake Carriers' Association recently awarded the job of shoveling the grain at $2.95 per 1,000 bushels. The scoopers get $1.85 per 1,000 bushels and last season the elevators got $1.35 per 1,000 bushels for the use of the steam shovels. The Erie and Northern elevators and some others now want to reduce the steam shovel charges to $1 per 1,000 bushels, as Contractor Conners asks, but the association sticks out and threatens to drive them out of the pool if they make such an agreement. While there are forty-five elevators in Buffalo a combination of eight of them has ruled for several years with the result that last season the Dakota and Sturgis Elevators cleared up $400,000 in profits, a percentage of which went to the pool.

In order to enjoy some of these profits, Bartlett, Frazer & Co. and Philip D. Armour, of Chicago, the largest grain shippers on the lakes, built the export elevator at Buffalo. It cost $160,000 and last season it is reported to have made $210,000, being outside the pool.

SUEZ CANAL TRAFFIC.

The official statement of the Suez canal traffic for the year 1897 contains statistics as follows :

NUMBER OF STEAMERS.

	British.	French.	German.	All Nationalities.
January	160	19	29	262
February	140	15	25	228
March	201	19	27	293
April.	181	18	29	278
May	164	15	28	248
June.	162	15	23	249
July	141	18	22	225
August.	143	16	28	226
September	138	14	29	223
October.	145	19	28	238
November	160	18	28	254
December.	173	15	29	262

FOR THE YEARS 1884 TO 1897 (OF ALL NATIONALITIES.)

YEAR.	No. of Steamers.	Tons Net.	Traffic Receipts. Francs.
1884	3,284	5,871,500	58,628,759
1885	3,624	6,335,752	60,057,259
1886	3,100	5,707,655	54,771,076
1887	3,137	5,903,024	55,995,298
1888	3,440	6,640,834	64,832,273
1889	3,425	6,783,187	66,167,579
1890	3,389	6,890,094	66,984,000
1891	4,206	8,699,020	83,421,504
1892	3,556	6,832,816	74,459,763
1893	3,342	7,659,558	70,714,833
1894	3,352	8,039,105	73,850,458
1895	3,434	8,448,246	78,158,582
1896	3,408	8,562,237	79,652,326
1897	2,986	7,898,981	72,897,635

THE WEST SUPERIOR STEEL PLANT PURCHASED.

The plant of the West Superior Iron & Steel Co. was sold this week under foreclosure proceedings. As has been expected the property was bid in by George Welwood Murray, the attorney of the reorganization committee of the company. The property was knocked down for the sum of $60,000. The sale was made to satisfy a bonded indebtedness of $1,339,000. Other claims, including taxes and the cost of conserving the property, bring the total indebtedness up to something like $1,750,000.

The Wisconsin Steel Co. is the new company in whose hands the reorganization committee will place the property just acquired, free from debt and in shape to proceed with manufacturing iron and steel products. The plans of the new company have not been made known but it is generally supposed that at least a large part of the plant will be put in operation. Extensive changes will be required before successful operations can be conducted, however. It is generally understood that it is the intention of the steel company to manufacture ship plate for vessels that may be constructed in future at the shipyard of the American Steel Barge Co. Colgate Hoyt, who is president of the large company, is a member of the reorganization committee.

Mr. Rockefeller himself is heavily interested in the American Steel Barge Co. and he now owns the steel plant. It is believed that in future years if Mr. Rockefeller has any more ships to build he will find it to his interest to have them built at the shipyard of the Steel Barge Co., since he has a plant where the plate may be manufactured.

NOTES.

MAJOR ANSEL F. TEMPLE, chairman of the Harbor Committee of the Chamber of Commerce of Muskegon, emphatically denies that there is a dangerous sand-bar at the entrance to that harbor. He will enter a protest with the railroad people. Capt. McLeod, of the Osceola, reiterates the statement that the bar exists with but 13½ feet of water over it.

AS it will cost $20,000 to repair the steamer Rosedale, its owners have abandoned it to the underwriters, who will hand it over to the Donnelly Wrecking Co. in payment for the work of saving the boat.—Canadian Engineer, Toronto and Montreal. A comparativly new Clyde-built steamer to change ownership for the cost of her wrecking bill shows an easy way to sell to the underwriters, only we are convinced that our contemporary has not got the foregoing item quite right.

THE McFarland Grain Company, Des Moines, Iowa, has concluded that the grain traffic from that section will be diverted to the Gulf. As a result it has abandoned its elevators at Madrid and other points on the main line of the Chicago and St. Paul tributary to Chicago, and will enlarge its plant in Des Moines. This change is due to the absorption of fifty per cent. of the stock of the Keokuk & Western Railway by the Kansas City, Pittsburg & Gulf Railroad, and the proposed construction of a connecting line between Gainesville, Mo., and Kansas City, giving a direct Det Mcines connection with the Gulf.

MATT O'BRIEN, Supervising Inspector of Steam Vessels at New Orleans, La., died on the 27th of January, after a short illness, from a complication of diseases. In the death of Mr. O'Brien the community in which he has lived so many years loses a valued aud estimable citizen, the service which he represents an able and distinguished officer. Mr. O'Brien was appointed to represent the steam vessel inspection service of the Gulf States by President Cleveland in 1885, and continued in office ever since. Although a Democrat in politics, his was one of the cases where efficiency held precedence over politics.

H. C. BURCHELL, the government engineer of Newfoundland, makes a statement in regard to the Simpson dry dock as follows: In reply to your inquiry with regard to the timber and concrete dry dock built by you for the government of Newfoundland and completed in 1884, I beg to say: 1st. There has been no expenditure on repairs on the dock itself since it was opened. 2nd. At this date everything appears to be thoroughly sound and the dock is in perfect working order and fully serves its purpose. A certificate like this comes in good time when there is so much controversy over poorly-built government dry docks.

IN ten years the United States, which occupied the second place among nations in foreign trade (meaning imports and exports combined) has fallen off to third place, and Germany has passed her in the race for supremacy, now held by England. United States Consul John C. Covert at Lyons, gives the figures in a report he makes to the State Department, devoted to quotations from an address delivered at Lyons by M. Jules Roche, former Minister of Finance and Commerce. During that period of ten years, the commerce of England augmented 32 per cent., that of Germany 46 per cent. and the United States 14 per cent., while France fell off 3 per cent.

THERE is a question up for consideration at the meeting of the Central Freight Association in Chicago which is of interest to Toledo shippers and railroads. It is proposed to advance the rate on grain to Buffalo from Toledo to 8½ cents. Grain rates from Toledo, Detroit and Port Huron to Buffalo are out of line with the rates from Chicago to New York. This is due to lake competition. Now the Pittsburg lines have asked that the same rates of 8 cents be authorized to Pittsburg points as well as Buffalo. If this is not done, the rates to Buffalo will be advanced to 8½c in line with the through freights.

APPLICATION will be made to the Parliament of Canada, at its next session, for an act to incorporate the Lake Superior & Rocky Mountains Navigation Co. to construct canals from Lake Superior near Thunder Bay, thence following a chain of lakes and rivers across the height of land to Rainy Lake, and by way of Rainy river to the Lake of the Woods; from the Lake of the Woods along Rousseau river to the Red river; thence along Red river, Assiniboine river, Lake Manitoba and Lake Winnipegosis to Cedar Lake on the Saskatchewan river; or in the alternative from the Lake of the Woods by way of Winnepeg river, Lake Winnipeg and the Saskatchewan to the last mentioned point; and from Cedar Lake on the Saskatchewan river and Bow river to Calgary, in Alberta, and along its northern branch to Edmonton.

CHICAGO
Nautical School,
20 MICHIGAN AVE., CHICAGO.

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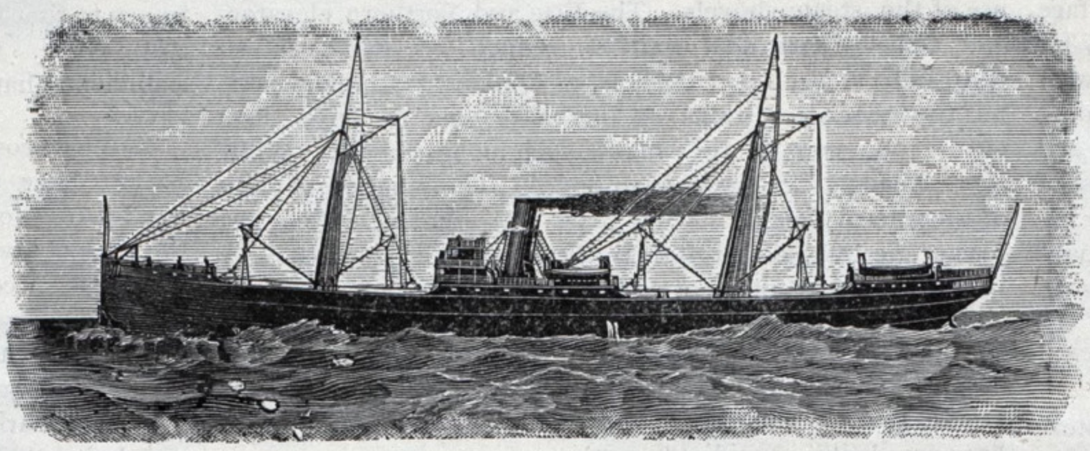

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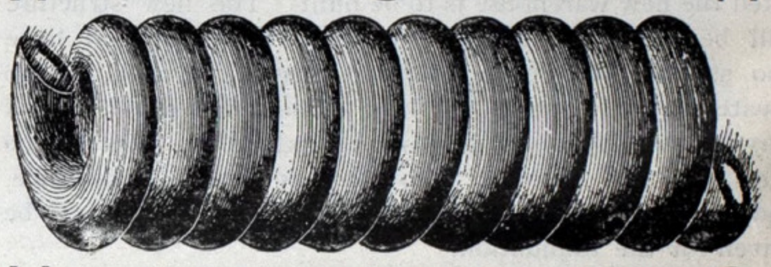

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LAKE CAR FERRY LINES.

There are at the present time in operation on the lakes 23 car ferries. Fourteen of these are high-powered steam ice-crushers, and two of them—the St. Ignace at the Straits of Mackinac, and the Marquette, owned by the F. & P. M. Ry. Co.—are the largest craft of their kind in the world. The number of these vessels connecting different railway lines on the lakes, especially on Lake Michigan, has increased wonderfully within the past few years. The combined capacity of the 14 steam vessels is 287 cars, while the nine barges or floats, which are towed by large tugs, are capable of moving 145 cars. The capacity of the 23 ferries is, therefore, 432 cars. The summary of particulars of these car ferries was made up from a report published by the car service committee of the American Railway Association. This committee was called upon to prepare a table relating to car ferry lines in all parts of the United States, in order to determine the rate of compensation for borrowing cars when carried on boats.

The Ann Arbor Railroad Co. owns two steamers, the Nos. 1 and 2, which run between Frankfort and Gladstone, distance, 98 miles; Frankfort and Menominee, distance, 80 miles; Frankfort and Kewaunee, distance, 60 miles; Frankfort and Manitowoc, distance, 79 miles. The total capacity for cars on each boat is 24. These boats also carry both freight and passengers.

The Canadian Pacific Railway Co. operates its lines between Windsor, Ont., and Detroit, distance, one mile. The company has two steamers with a capacity of 16 cars each, and the average daily number of cars ferried is 100 and the length of time the cars are on board the steamer is 11 minutes.

The Lake Michigan Car Ferry Transportation Co. operates its line between South Chicago and Peshtigo harbor, distance, 240 miles—the longest car ferry route in the world. The company owns four car carrying barges, with a total carrying capacity of 117 cars. It also owns three tugs, the S. M. Fischer—probably the most powerful tug in the United States—the J. C. Ames and E. G. Crosby. The average daily number of cars ferried is 40 and the length of time the cars are on board the barges is about 30 hours. The company also operates a line between Manitowoc and Benton Harbor, the distance being 175. One barge and tug are employed on the line. The barge has capacity for 28 cars and the length of time cars are on board is about 24 hours.

The Michigan & Ohio Car Ferry Transportation Co. operates a line between Sandusky and Detroit. Two floats are employed, each with a capacity of 14 cars and the length of time the cars are on board is 9 hours.

The F. & P. M. Transportation Co. operates a line between Ludington and Manitowoc, distance, 56 miles. One steamer, the Pere Marquette, is employed on this route and she has capacity for 30 cars, which is the average daily number ferried. The length of time cars are on board is 3½ hours.

The Grand Trunk Ry. Co. operates a line between Windsor and Detroit (D. G. H. & M. slip), distance ½ mile; and another from Windsor to Detroit (Wabash slip) distance, 2 miles. The company employs two steamers, each with a capacity of 16 cars, and the average daily number of cars ferried is 340, and the length of time cars are on board is 10 minutes on the first-named route and 17 minutes on the last-named route.

The Michigan Central Ry. Co. also operates two lines, one between Detroit and Windsor, and Mackinac and St. Ignace. On the Detroit and Windsor the distance is one-half a mile, and three steamers are employed with a total capacity of 63 cars and the average daily number of cars ferried is 907 and the length of time the cars are on board is 10 minutes. The distance between Mackinac and St. Ignace is 8 miles. Two steamers are employed with a total carrying capacity of 30 cars.

The U. S. & Ontario Navigation Co., between Conneaut and Port Dover, Ont., distance, 68 miles. The company operates one steamer with a total capacity of 26 cars.

The Chicago & West Michigan Ry. Co., between Milwaukee and Muskegon, distance, 70 miles. One steamer does the work on this route and has a carrying capacity of 26 cars.

NOTICE TO MARINERS.

LIGHT-HOUSE ESTABLISHMENT,
OFFICE OF THE LIGHT-HOUSE INSPECTOR, 9th DIST.,
CHICAGO, ILL., Feb. 2, 1898.

Notice is hereby given that the steamer City of Duluth, wrecked at the entrance to harbor of St. Joseph, Mich., has broken to pieces, and the light established by this department has been discontinued. When practicable, a buoy will be placed to mark this wreck.

By Order of the Light-House Board:

C. O. ALLIBONE, Lieut. Comdr. U. S. N.,
Inspector 9th Light-House Dist.

TO CONSOLIDATE LAKE MICHIGAN PASSENGER LINES.

The recent report that Chicago parties had evolved a project to obtain control of all passenger steamers doing business on Lake Michigan and place them under one management, led to an investigation, and it was learned that there would be no gigantic pool or consolidation of lake steamer lines this coming season. That such a consolidation was contemplated and even probable two weeks ago the parties interviewed acknowledged. The reason given for the failure of the deal to materialize is that the whaleback steamer Christopher Columbus was the nucleus of the enterprise and the whaleback model having passed into the control of another corporation connected with the Goodrich line, the incentive to pool disappeared and the project withered. Frank O. Lowden, attorney for the Goodrich Transportation Co., made this admission: "I represent the Goodrich company only as a lawyer in this matter and while I am willing to say that the contract for the sale of the Columbus has been signed and the vessel has changed hands, I would not say the Goodrich Transportation Co. made the purchase."

Mr. Lowden might have admitted that the Christopher Columbus has been purchased in the interest of the Goodrich Transportation Co. It is probably a matter beyond dispute that President Goodrich did not conduct the negotiations for the purchase of the popular whaleback steamer, but he had full knowledge of what was being done. The facts, briefly stated, are that the negotiations were conducted by a party or parties to all intents and purposes outside of the Goodrich Transportation Co., yet interested in its affairs; that the terms agreed upon were the payment of a sum of money down and the balance in three yearly installments, secured by President Goodrich's bond. Just what price was paid for the steamer cannot be learned definitely, but it is supposed to be anywhere from $140,000 to $160,000—and mighty cheap at the highest figures.

Concerning the consolidation deal Mr. Lowden said that it had been talked of, but never was very much to be depended upon. Andrew Crawford of the Graham & Morton line said: "We were invited to figure on entering the proposed pool, but we did not care to do so." An official of one of the lines said the whole matter was settled at the Goodrich annual meeting held in Milwaukee last week.

ANOTHER ILLINOIS LAKE PORT.

James H. Van Vlissingen, for the Winthrop Harbor and Dock Co., has, during the last week, received of the Secretary of War a permit for the construction of a 20-foot harbor upon the property of the company, north of Waukegan, in Lake county, Illinois, the work to be done under the supervision of Capt. George A. Zinn, U. S. A., the engineer officer in charge of that location. The parallel piers will be constructed 1,700 feet long, affording an entrance to the harbor 350 feet wide. The inner basin will have the same width, and slips will be constructed upon both sides 150 feet in width. The latter work will be undertaken only as required by the demand. The initial outlay is estimated at $200,000. The Winthrop Harbor and Dock Co. is to commence the construction of the harbor with the opening of the season of navigation. The service of the Elgin, Joliet & Eastern Railway (outer Belt Line) is to be extended to Winthrop harbor, thus placing that point on an equality, in respect to freight rates, with the City of Waukegan. The Winthrop Harbor and Dock Co. owns 2,700 acres, of which 700 lie upon the flat east of the Chicago & Northwestern Railroad, and 2,000 acres upon the bluff west of the railroad right of way. A. V. Powell, civil engineer, will have charge of the harbor construction for the company. It is the purpose of the company to make Winthrop harbor a model town.

EASTERN FREIGHT REPORT.

Messrs. Funch Edye & Co., New York, report the eastern freight market as follows: Whilst we cannot advise an improved freight market, a fair amount of fixtures has taken place nevertheless, referable mainly to the closing up of open contracts. At the moment the majority of boats offering on our market have been disposed of, with some inquiry still unfilled, and it appears likely that in the event of owners advancing their figures, some slight improvement over rates momentarily ruling may be secured. There is still a moderate demand for large grain boats, especially such yielding privilege of some general cargo, and a few steamers could be placed for the eastern route with case oil and general cargo from here and the Gulf ports. The inquiry for cotton is not active, and rates tending slightly downward; for timber further fixtures could be made on some concession being allowed by owners.

During the last week business in sail tonnage has again been light, as the scarcity of offerings of suitable vessels continues. The demand for ships for the timber trade from Gulf to Europe and for lumber to South America continues fair, but the relative views of shippers and owners are still too far apart to permit of more numerous fixtures. A good inquiry for case oil vessels to the far east likewise continues and full rates prevail, even for quite remote loading. Barrel oil vessels for Europe, on the other hand, are little sought after, but, owing to scarcity, occasionally obtain fair rates to fill a pressing order. There is very little doing in general cargo to South America or South Africa, but Australia freights about hold their own, with the demand limited to loading during the summer months, present wants of shippers being generally filled.

MARITIME LAW.

THE NEWPORT NEWS.

GOODWYN V. THE NEWPORT NEWS.

District Court, E. D., Virginia. Aug. 20, 1897.

1. COLLISION—TUG AND STEAMER IN CHANNEL—FOG—SIGNALS—ERROR IN EXTREMIS.—A tug navigating in a channel in the edge of a fog bank, on perceiving a steamer approaching at a distance estimated by the tug's master at 400 yards, gave the proper signal for passing starboard to starboard. The steamer answered by two blasts of her whistle, signifying her assent. Those on board the tug testified that the answering signal was heard only as one blast, and thereupon the tug changed her course, and was run down while attempting to cross the steamer's bows. Held, that this error was not one committed in extremis, and the tug was therefore liable for at least half the damages.

2. SAME—EXCESSIVE SPEED.—When two vessels approach each other at night in a narrow channel, under such conditions of weather as affect the visibility of lights and the hearing of sounds, there must always be some risk of collision. Held, therefore, that a large passenger steamer proceeding at over 12 miles an hour down the Elizabeth river below Norfolk, and approaching the low-lying fog bank, through which the white light of a tug was perceived, her colored lights being invisible, was in fault for violating rule 21, requiring every steam vessel, when approaching another vessel so as to involve risk of collision, to slacken her speed, and stop and reverse if necessary.

This was a libel in admiralty by Caleb Goodwyn, master of the tug Katie, against the steamer Newport News, to recover damages occasioned by collision.

By a curious coincidence the number of lives lost at sea during 1896 in British merchant ships is returned as exactly 1,897.

PROPOSALS.

PROPOSALS FOR DREDGING.—U. S. Engineer Office, Duluth, Minn., January 31, 1898. Sealed proposals for dredging in Portage Lake Ship Canals, Keweenaw Point, Mich., will be received here until noon, February 28, 1898, and then publicly opened. Information furnished on application. CLINTON B. SEARS, Major, Eng'rs. 5-8

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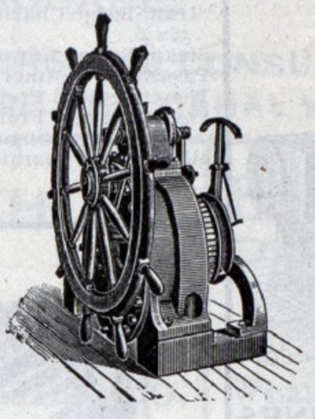

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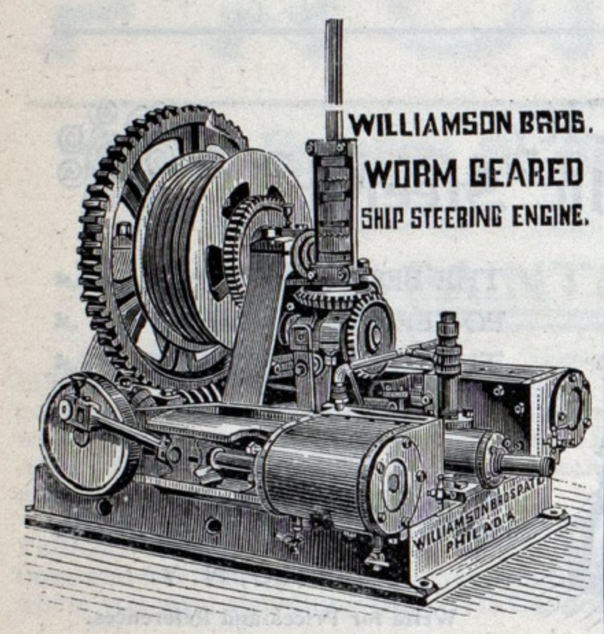

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Passenger Steamer City of Kalamazoo, South Haven, 20 and 40x30.
Steamer Oval Agitator, Chicago, 14 and 28x20.
Tug E. G. Crosby, Muskegon, 16 and 30x24.
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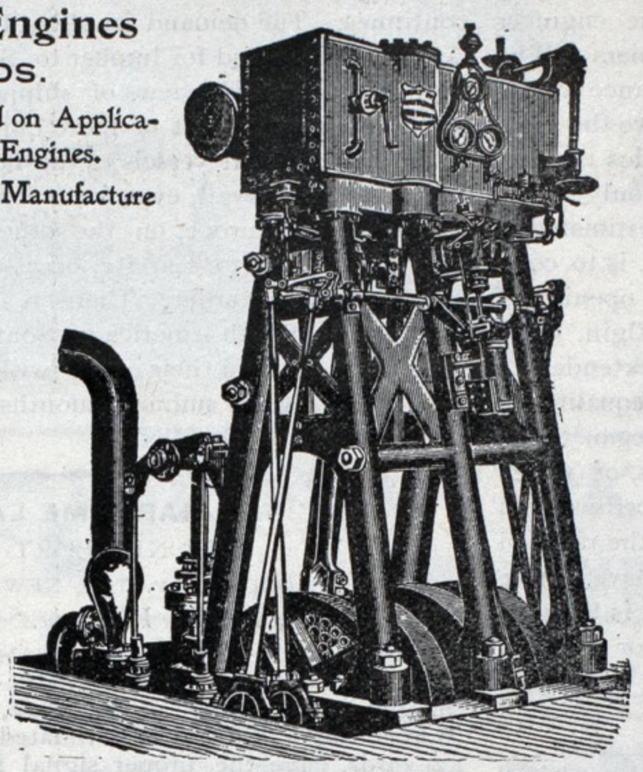

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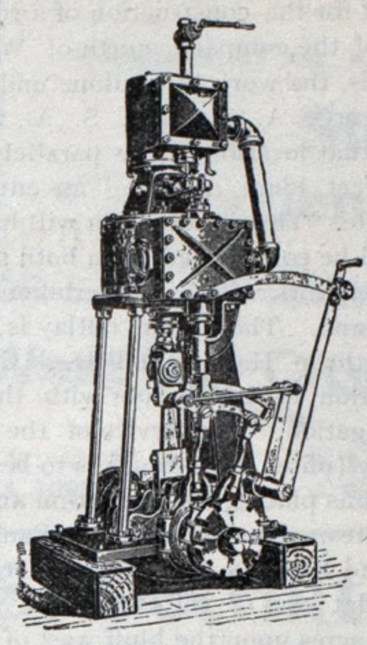

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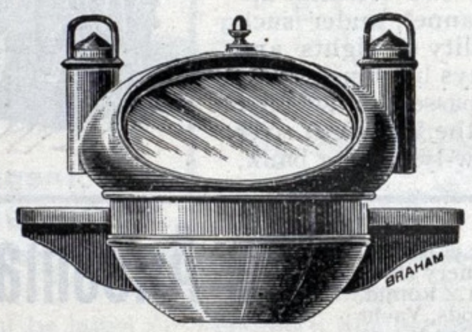

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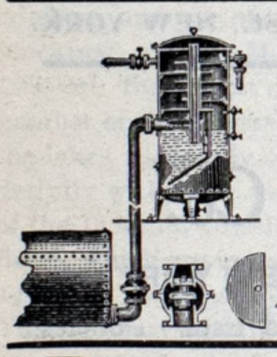

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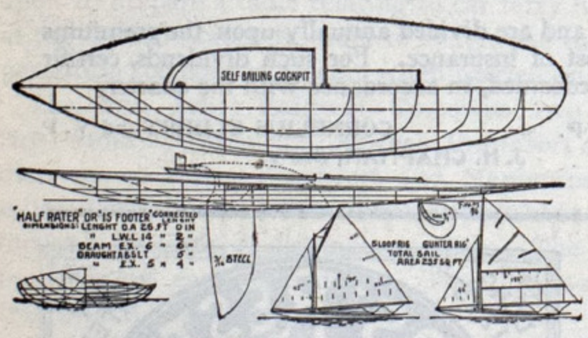

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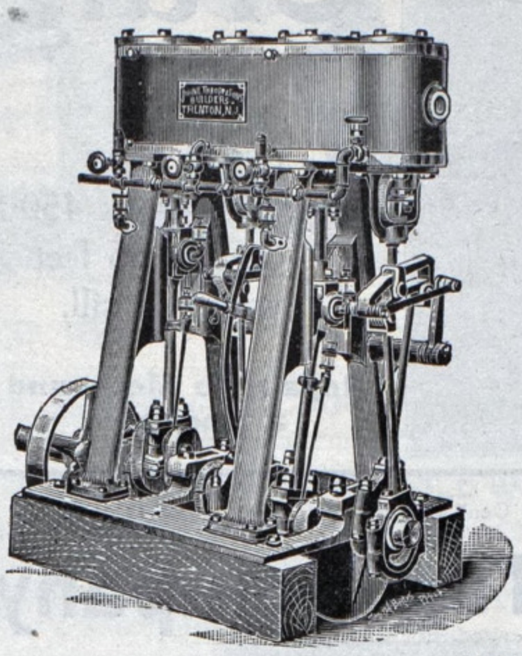

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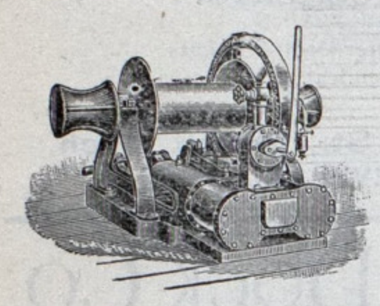

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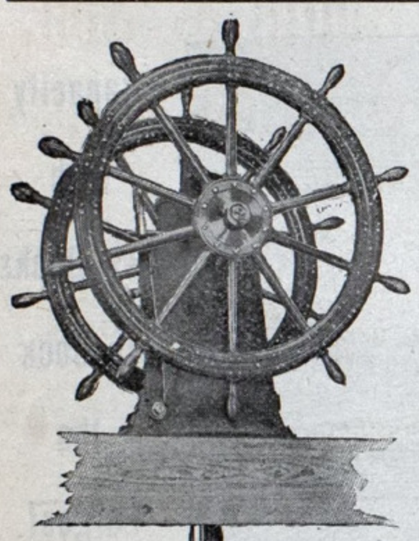

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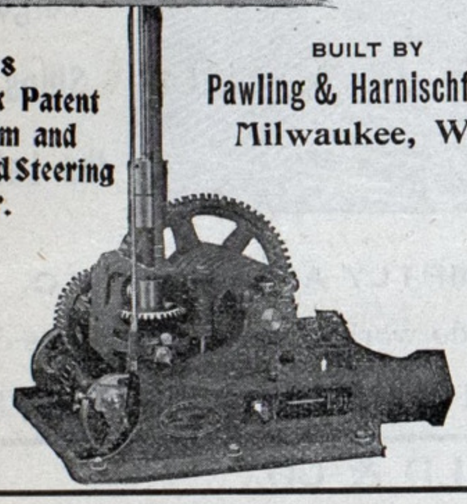

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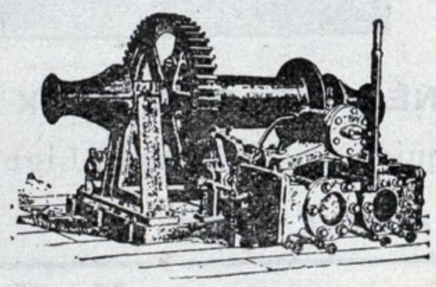

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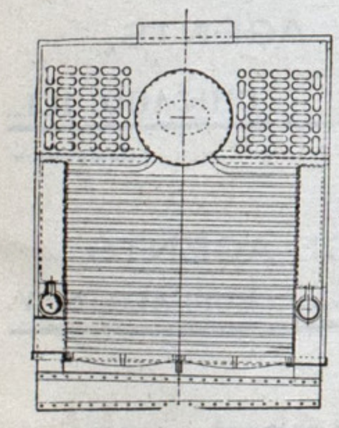

26 HANCOCK AVE., DETROIT, MICH., Feb. 9, 1897.

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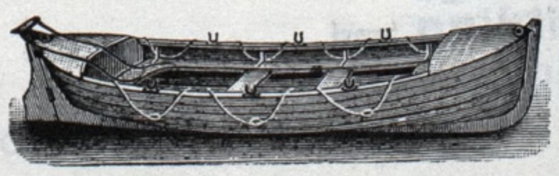

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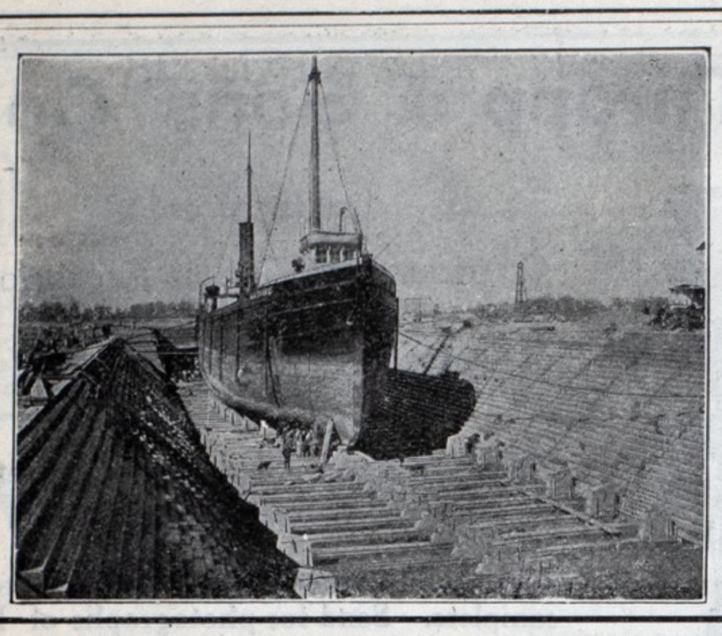

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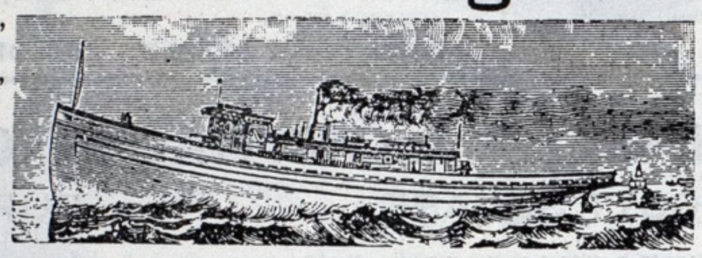

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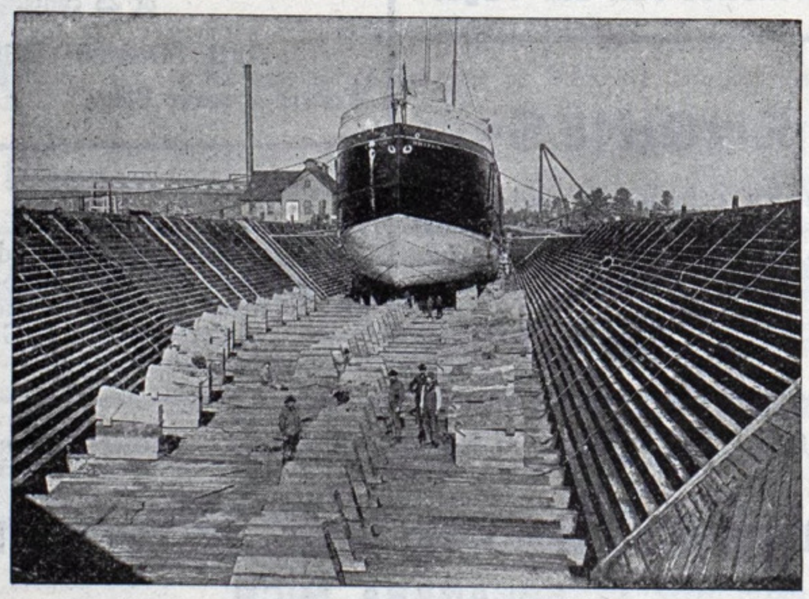

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Length, Extreme	587 feet.	Entrance, Top	55 feet 9 in.
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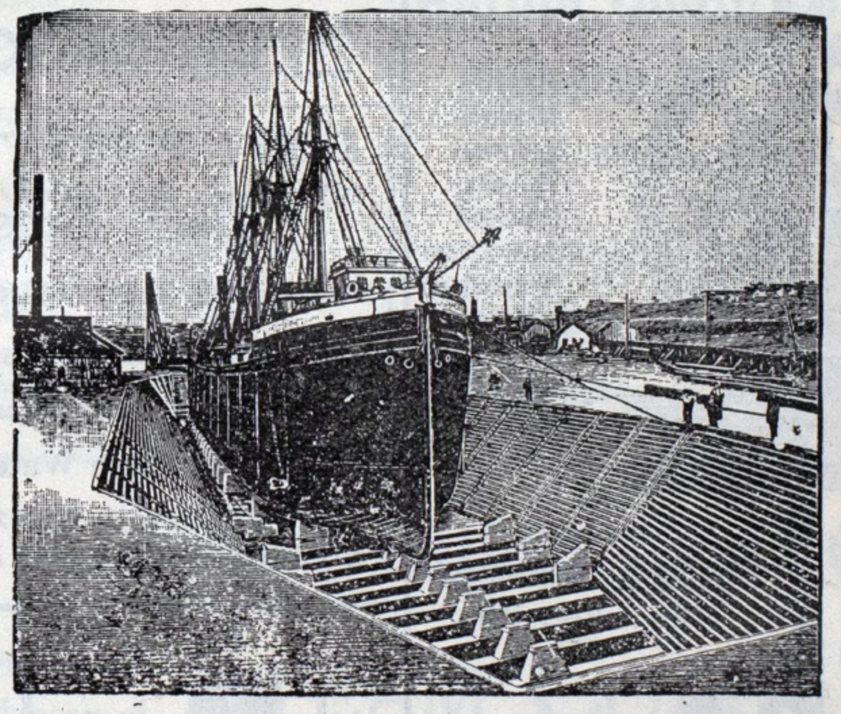

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